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Marine Casualty Investigations

Enquêtes sur les accidents maritimes

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COMMERCIAL VESSELS

Summaries of Reports of Investigations into Marine Casualties and Accidents Aboard Ships

Issue No. 11 September 1990

Summaries of Commercial Vessel Marine Casualties and Accidents

This publication summarizes the Reports of Investigation into marine casualties and/or marine accidents involving commercial vessels which were investigated by the Marine Casualty Investigations Division of Transport Canada and is published three times a year. There is another publication covering fishing vessels.

Note:

1. A glossary of terms and abbreviations used can be found at the end of this publication.

2. In this publication, unless stated otherwise:

   - all times mentioned are local times;
   - all Regulations referred to are made pursuant to the Canada Shipping Act, and
   - all vessels referred to are Canadian.

The full report of the summaries contained herein may be obtained by writing to:

Director
Canadian Transportation Accident
Investigation and Safety Board
Investigations - Marine
P.O. Box 9120
Alta Vista Terminal
OTTAWA, ONTARIO
K1G 3T8

Readers are reminded that this publication and the Reports of Investigation issued by the Marine Casualty Investigations Division are released for accident prevention purposes only and are confined to cause-related circumstances.

Their contents may be deficient and misleading if used in any other process and are not to be used or admitted in evidence in any legal proceedings, either civil or criminal, arising out of any casualty described therein. The statements, opinions and findings in the reports and summaries are those of the Marine Casualty Investigations Division only and do not constitute admissions made by or on behalf of Her Majesty the Queen in right of Canada.

Effective March 29, 1990, the mandate to conduct investigations into Marine occurrences was transferred to the Canadian Transportation Accident Investigation and Safety Board (CTAISB) - Investigations Marine. In accordance with the Act establishing this new organization, outstanding investigations conducted under the Canada Shipping Act prior to this date are being completed and distributed by CTAISB - Investigations Marine.

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"SURVIVOR"

Two views of the vessel.

Vues du bateau.

"SURVIVOR"

Death of operator, Galiano Island, B.C., January 16, 1990

Summary

The "SURVIVOR", a 9 gross ton vessel of moulded reinforced plastic construction, was employed as a log salvage vessel with a 2 person crew comprising her owner/operator and a deckhand. Her cabin/wheelhouse structure was situated forward with the general work area located aft.

On January 15, 1990, the "SURVIVOR" left Whaler Bay on Galiano Island to 'comb' the north shore beaches of the island for logs. Having salvaged several logs, the vessel entered Cook Cove, at about 0930, and with the vessel close inshore, the deckhand waded ashore to attach the towing chain to a large log. With the deckhand back aboard, the operator engaged astern propulsion to take up the slack. The vessel began to swing as she took the strain and grounded before power could be reduced. The vessel's keel entered a crevice in the rocks and she could not be manoeuvred into deeper water. Attempts to pry the vessel free using a pikepole were unsuccessful and, with the tide now ebbing, she became stranded. Two lines were secured ashore as the crew awaited the next high tide which was predicted for 2023.

There were several bottles of liquor on board and the two crew members began drinking at about 1600 after the deck hand had rowed ashore in the 12 ft lifeboat to obtain fresh water. The crew were unable to free the vessel at the next high water which was more than a metre lower than the one on which they grounded. Meanwhile, the weather conditions, which at the time of the grounding had been described as light winds, rippled sea and good visibility, deteriorated throughout the night and the vessel began pounding heavily in the surf. The hull began to leak and the motor stalled.

The deckhand left the vessel, at about 0500 the following morning, to walk to a nearby house to seek assistance but he returned to the "SURVIVOR" after an abortive attempt using a local fisherman's vessel to reach the "SURVIVOR". The operator could not be found and the deckhand could not reboard because of the weather conditions.

The ensuing search of the shoreline by local residents and the fire department also utilized several Coast Guard vessels and a helicopter, RCC having become involved when a radiotelephone conversation regarding the "SURVIVOR" was overheard. The body of the operator was found, awash in the surf, about 2½ cables south of the vessel, and was taken to a nearby hospital where a subsequent autopsy revealed that death was due to drowning in sea water.

The "SURVIVOR" was refloated with assistance but with an estimated replacement cost of $120,000 was a constructive total loss. No pollution was reported as a result of this casualty.

Findings

During the early morning hours of January 16, 1990 after the deck-hand departed the vessel, the operator lost his life and his body was later discovered on the shore about 2.5 cables south of the vessel.

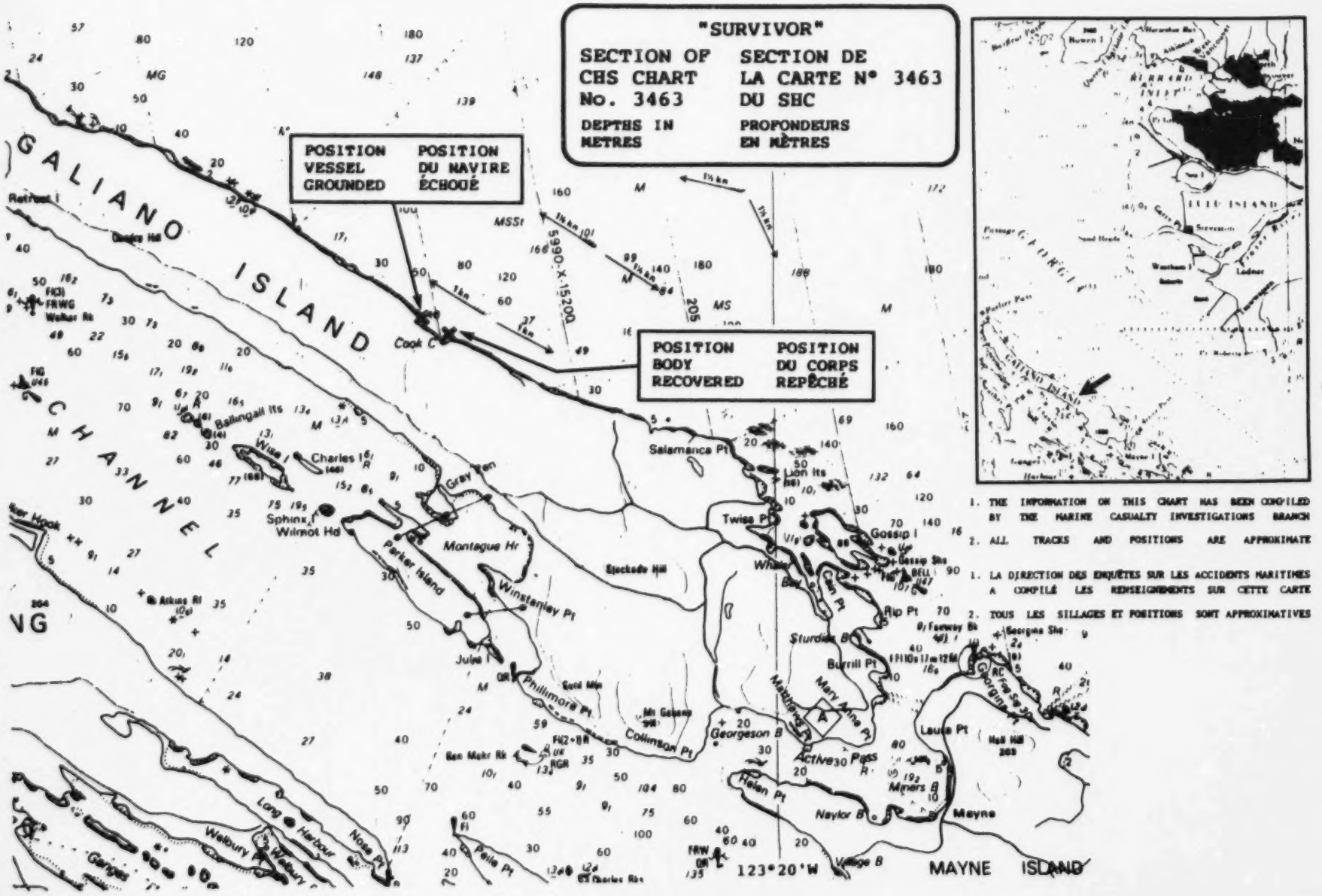
In the absence of any eye witnesses, the precise cause of the accident is unknown but it would appear that the following factors contributed to the accident:

- the deceased was not in good health;
- at times his legs were unable to support his body weight;
- the deceased had consumed an unknown quantity of alcohol;
- the alcohol may have reacted adversely with his physical condition and further impaired his ability to make rational decisions;
- the vessel was stranded on the shore and while stranded, weather conditions deteriorated which resulted in considerable damage occurring to the vessel;
- the afterdeck is small and requires a person to be agile and sure-footed; and
- the operator was a non-swimmer and, on voluntarily or involuntarily entering the water, was overcome and drowned.

Other Findings

There were three DOT approved lifejackets aboard the vessel, however, the operator did not wear one.

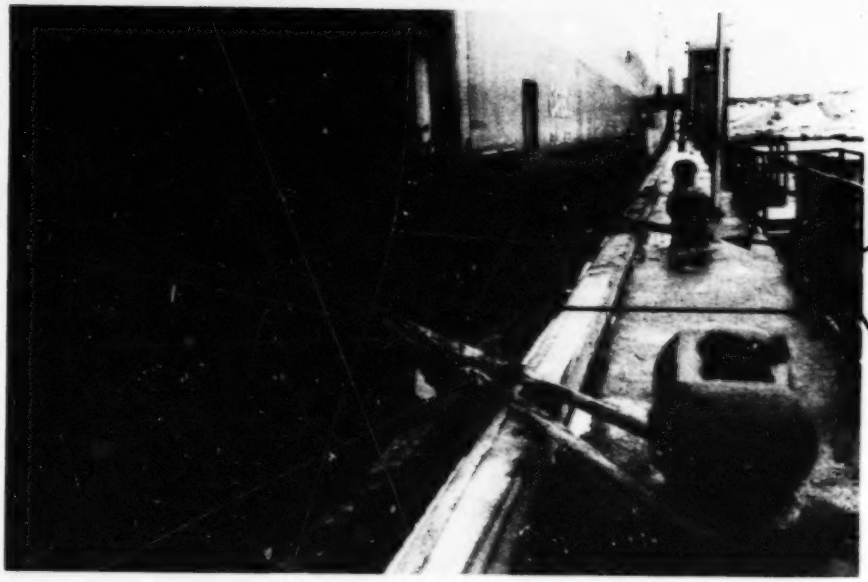
The vessel was fitted with an operational VHF radiotelephone but a call for assistance was not made.



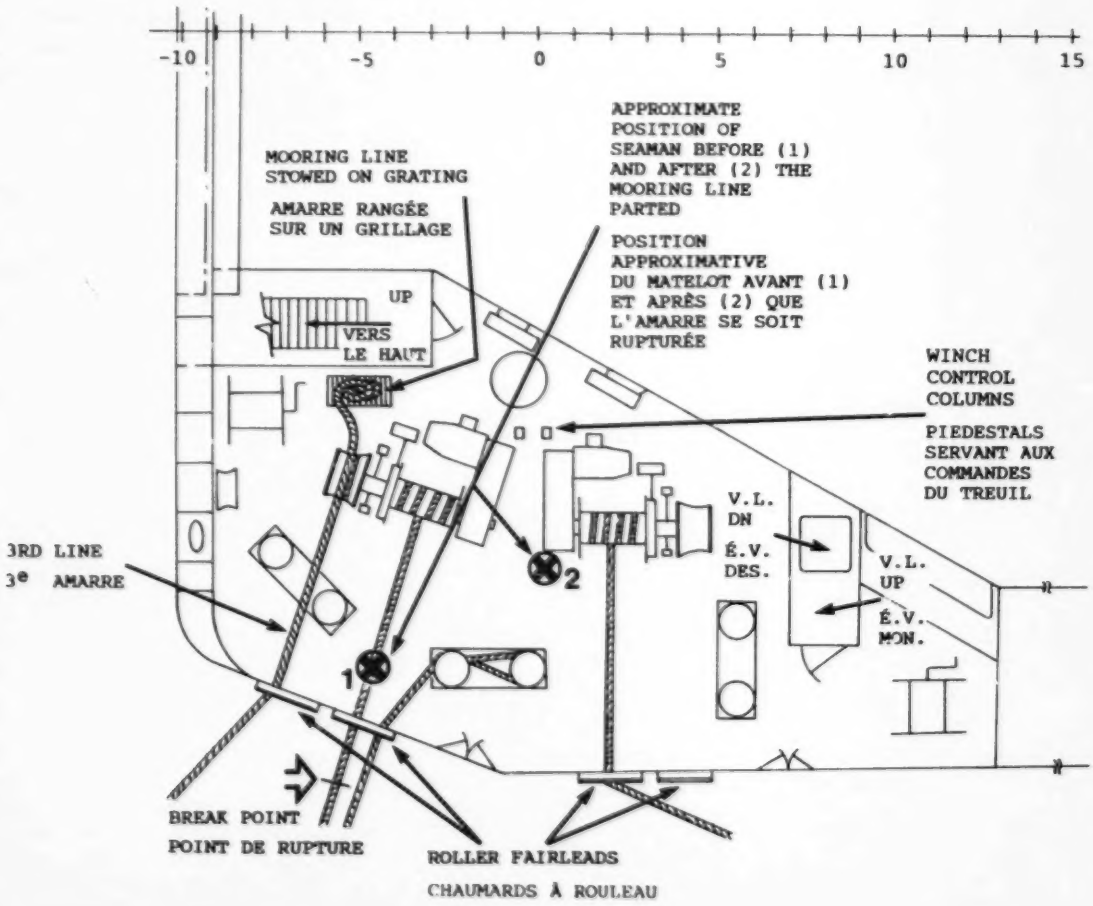
1. THE INFORMATION ON THIS CHART HAS BEEN COMPILED BY THE MARINE CASUALTY INVESTIGATIONS BRANCH
2. ALL TRACKS AND POSITIONS ARE APPROXIMATE

1. LA DIRECTION DES ENQUÊTES SUR LES ACCIDENTS MARITIMES A COMPILÉ LES RENSEIGNEMENTS SUR CETTE CARTE
2. TOUS LES SILLAGES ET POSITIONS SONT APPROXIMATIVES

"CARIBOU"



At North Sydney, showing starboard after moorings.
Vue de tribord après l'amarrage à North Sydney.



PLAN OF MOORING FLAT **PLAN DE LA PLATE-FORME D'AMARRAGE**

"CARIBOU"

Death of a crew member, North Sydney, N.S., December 1, 1989

Summary

The "CARIBOU" is a 27,213 gross ton, RoRo, passenger/vehicle ferry, which operates between North Sydney, Nova Scotia and Port aux Basques, Newfoundland. The terminals at these two ports have their dockside facilities, including shore bollards, so arranged as to be compatible with the vessel's ramps, fairleads, etc.

When the vessel was securing at North Sydney on December 1, 1989, after completing her second trip of the day from Port au Basques, the wind was near gale force from the North with a forecast to increase in strength, there were snow flurries and the air temperature was -4°C. Because of the considerable windage area of the "CARIBOU", given her high superstructure and funnels, the master ordered that a third mooring line be run out from the starboard quarter on this occasion, a not unusual requirement in such weather conditions.

When the third line was run ashore, the vessel was 'in position' with the main engine in 'neutral' and the stern thruster operating to hold the vessel hard against the dock. The mooring lines already ashore aft consisted of a single end from the forward winch and a bight from the after winch. The third line was taken to the after winch for tensioning, with the drum to which the bight was attached being disconnected from the winch drive train. As the line was being tightened, the bight parted with the hauling part of the bight recoiling inboard to strike a seaman and throw him head first onto the steel frame of the adjacent winch. The time was approximately 2147. The local police and an ambulance were summoned and the injured seaman was transported to a local hospital where he was pronounced dead on arrival.

Findings

Whilst the "CARIBOU" was berthing at the Marine Atlantic Ferry Terminal, North Sydney, on the night of December 1, 1989, in gale force, northerly winds, one of her crew was fatally injured as a result of the parting of a mooring line.

It would appear that the following may have contributed to this accident:

- gusty, near gale force winds were tending to blow the vessel off the quay with a corresponding increase of tension in the mooring ropes;

- the winch operator did not have a clear view of the seamen handling the lines;

- the mooring operation, working in and around ropes at various tensions, is inherently dangerous with little or no protection;

- the mooring crew was experienced and familiar with the operation but such familiarity would tend to reduce the appreciation of risks involved; and

- an independent examination of the parted mooring rope showed that the rope cover retained substantially zero strength at the break point, and that the straight retained strength of the whole rope was about 35 tonnes compared to the manufacturer's listed strength of 90 tonnes.

Other Findings

The defects found in the brake mechanisms of three of the four winches suggests either harsh or improper treatment or a latent defect in the design of the components, or both, and such defects had not been promptly remedied.

Instead of being positioned in a protected area at or near the side of the vessel, the winch controls had been placed such that the operator's view of the work station was restricted and there was no system in place to improve this vision.

There was reportedly no routine inspection of the mooring lines to either determine the need to crop or end-for-end them or to require samples be tested for wear.

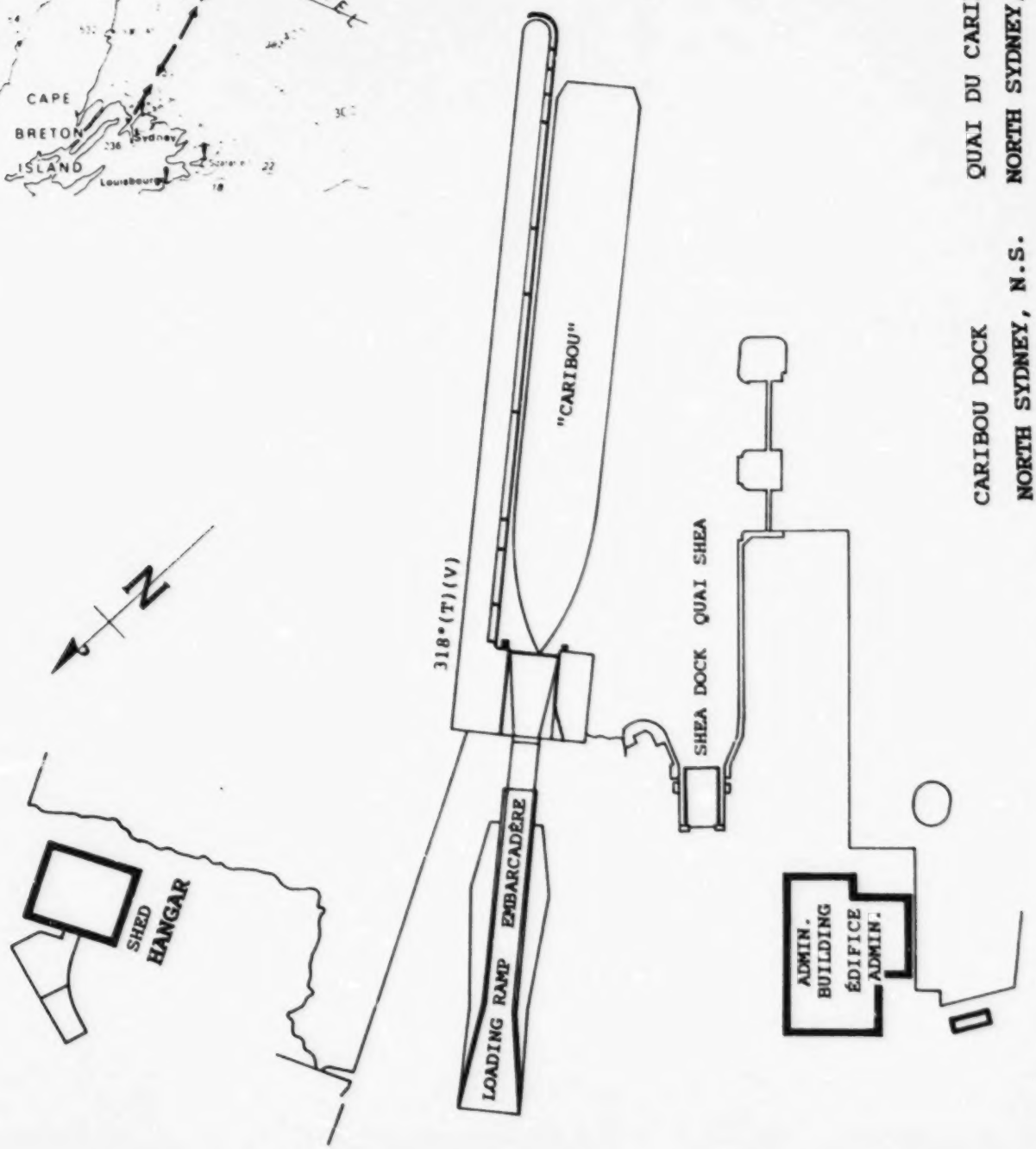
The diameter of the roller fairleads is not the optimum diameter for rope preservation.

Fairlead rollers and drum ends had been painted, contrary to the practice of good seamanship.

There was no certificated officer in charge of the aft mooring party, nor was one required by regulation, but an officer has since been assigned to this task.

CARIBOU DOCK
NORTH SYDNEY, N.S.

QUAI DU CARIBOU
NORTH SYDNEY, N.E.



"BERING STRAITS"

"STRAITS WATER SKIDDER"

"BERING STRAITS"

Girding, sinking with death of a crew member, False Creek, B.C., December 14, 1989

Summary

The "BERING STRAITS" is a 59 gross ton tug, built in 1965. She develops 850 BHP, has a single propeller and a Kort nozzle rudder. She operates with a crew of two, the master and a deckhand. In the early hours of December 14, 1989, the "BERING STRAITS" was engaged in shifting a 2,390 gross ton, loaded gravel barge, the "STRAITS WATER SKIDDER", from a buoy off Kitsalano Point in English Bay to a berth inside False Creek. With the "BERING STRAITS" towing the barge some 10 m astern of her, and the assist tug "COLLEEN K" in attendance, the tow proceeded into False Creek with the visibility steadily decreasing in fog until it was between 100-200 m as they approached the turn to port, passing Spruce Harbour Marina.

At this time both the master and the deckhand were in the wheel-house of the "BERING STRAITS", the master steering by hand, alternately looking ahead and into the radar. Both wheel-house doors were closed and dogged, a practice, insisted upon by the master, which reduces the risk of downflooding in the event of taking water on deck. As the turn progressed, the "COLLEEN K" saw the "BERING STRAITS" heading off to port at an increasing angle to the barge's fore-and-aft line until, at about 45° when the "BERING STRAITS" appeared to alter back to starboard, she also began to list to starboard, towards the barge. With the taut tow-line now leading out abeam, the "BERING STRAITS" was girded. She lay over on her beam ends and then completely capsized all in less than a minute. The deckhand managed to escape as the vessel rolled over and he was rescued from the overturned hull by the "COLLEEN K". The master was not so fortunate and perished, trapped in the wheel-house. The time was approximately 0435. The pull of the overturned tug caused the tow-hook to deform, disengaging the barge, which initially grounded on the north shore before being taken in tow to the intended berth at about 0800. The "BERING STRAITS" sank, bow first, in 25 ft. of water at 0520 but was raised that afternoon and towed to a repair slip.

Findings

In foggy but otherwise good weather conditions, the Canadian tug "BERING STRAITS" girded, capsized and sank as a result of becoming out of position relative to her tow. The master drowned as a result of the casualty. It would appear that the following were contributory factors:

- the tug was being operated in darkness and fog, with visual shore references severely reduced;

- the tug was being commanded from the enclosed wheel-house, as opposed to the open bridge;

- a radar was installed in the wheel-house but not on the open bridge above;

- immediate access to the radar was necessary in the prevailing conditions;

- in the restricted visibility prevailing at the time of the casualty, the master was in sole charge of the tug's navigation, radar, steering and the operation of her towing equipment;

- the master may have become temporarily disoriented when transferring from visual to radar navigation and thus experienced difficulty obtaining accurate information regarding the relative movement of the two vessels; and

- the tug's abort system was not activated.

Other Findings

At the time of the casualty, 0430, the tug's crew had worked 10½ hours of a 12 hour night shift.

The operating area was confined by a large concentration of pleasure craft at marinas in the immediate vicinity.

The aspect of round bowed barges is more difficult to assess than the conventional flat fronted barge.

The "BERING STRAITS" was not required to comply with the stability criteria in force for newer tugs but if these criteria were applied, the tug's transverse stability characteristics were significantly less than these minimum requirements.

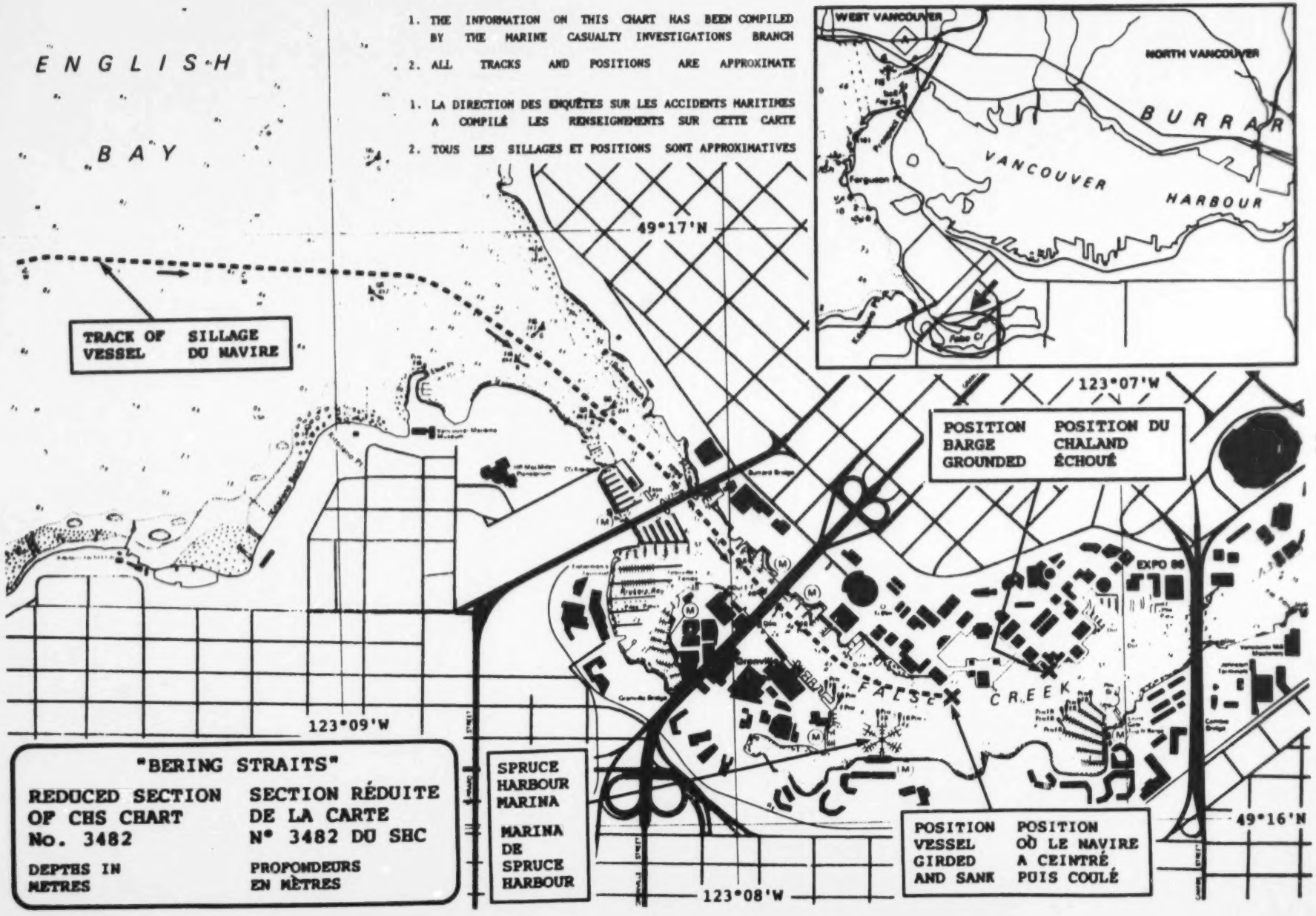
It is unlikely that a tug meeting the minimum stability criteria for newer tugs could have recovered from the force exerted on the "BERING STRAITS" when hove-down by the barge "STRAITS WATER SKIDDER".

The SAR IRB was not available owing to a labour dispute, but even if it had been available, its crew were untrained in scuba diving and could not have saved the master.

The EPIRB was not positioned where it could float free of the sunken vessel and did not do so.

Performance difficulties experienced with the steering gear appear to have been rectified several days before the casualty.

Use of towing pins and hold-down gear on a short bridle and in confined waters would have been impractical.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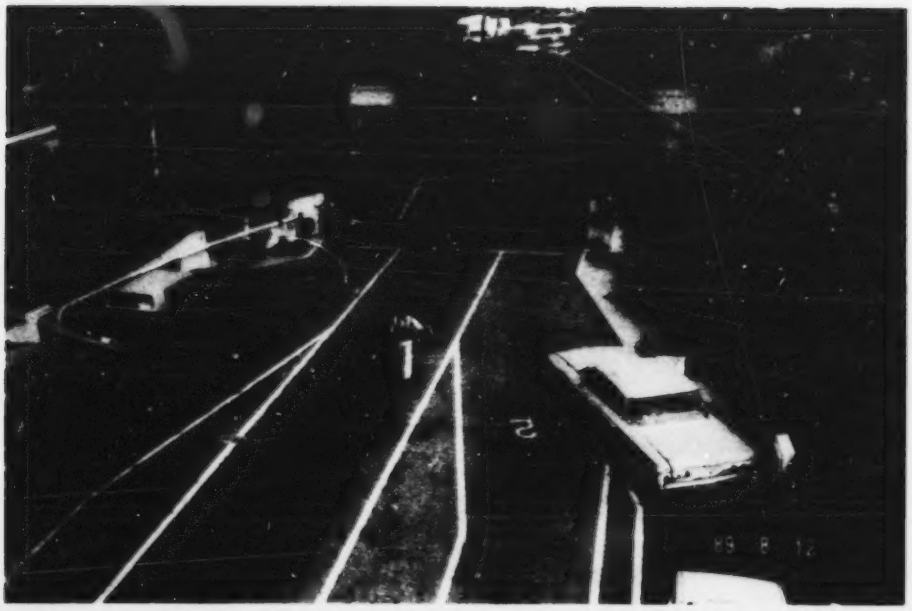
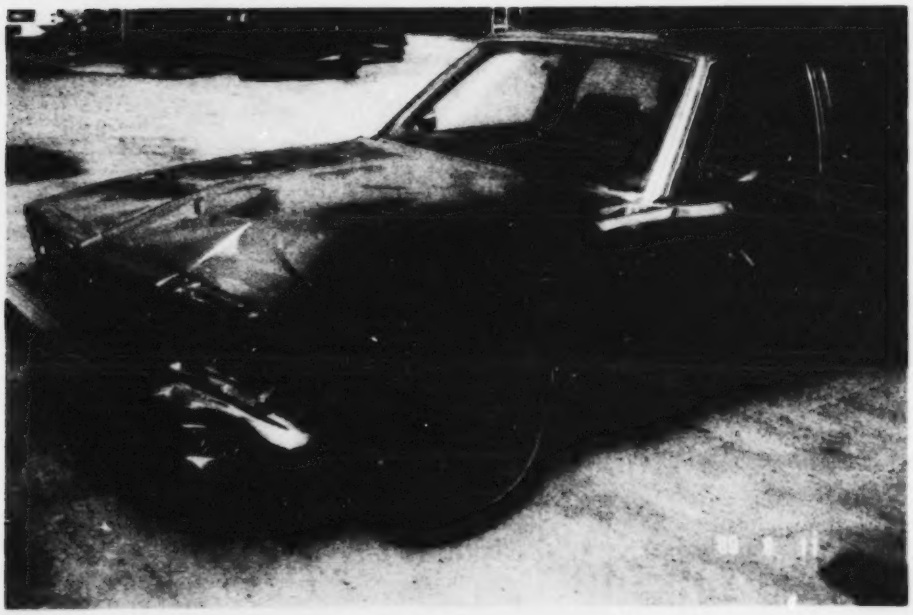
ENGLISH BAY
WEST VANCOUVER
NORTH VANCOUVER
BURRARD
VANCOUVER HARBOUR
49°17'N
123°07'W
123°09'W
123°08'W
49°16'N
TRACK OF VESSEL
SILLAGE DU NAVIRE
POSITION BARGE GROUNDED
POSITION DU CHALAND ÉCHOUÉ
POSITION VESSEL GIRDED AND SANK
POSITION OÙ LE NAVIRE A CEINTRÉ PUIS COULÉ
EXPO 86
FALSE CREEK
"BERING STRAITS"
REDUCED SECTION OF CHS CHART No. 3482
SECTION RÉDUITE DE LA CARTE N° 3482 DU SHC
DEPTHS IN METRES
PROFONDEURS EN MÈTRES
SPRUCE HARBOUR MARINA
MARINA DE SPRUCE HARBOUR



Lead vehicle in lane 1 being directed off vessel.

Véhicule de tête dans la rangée N° 1 se dirigeant vers la sortie.



Vehicle involved in accident.

Véhicule impliqué dans l'accident.

"BOWEN QUEEN"

Injury to crew member, Fulford Harbour, B.C.
August 5, 1989

Summary

The "BOWEN QUEEN" is a 1,476 gross ton, double ended, open deck, RoRo, vehicle and passenger ferry operating between Fulford Harbour on Salt Spring Island and Swartz Bay Terminal on Vancouver Island.

At 1050 on Saturday August 5, 1989, the "BOWEN QUEEN" secured at Fulford Harbour and prepared to unload her full car deck of 75 vehicles together with the 220 passengers she was carrying. With the apron lowered and the barrier removed the foot passengers were driving up the ramp and on to the passenger walkway. With the passengers clear of the roadway on the ramp, one of the deck-hands began directing vehicle traffic ashore, beginning with the centre lane, then lane 2 and lane 3. As the vehicles from lane 3 were driving off, the chief officer, who had completed docking the vessel, came down to join the deck-hand on the car deck. As the last vehicle in Lane 3 was passing under the superstructure, the deck-hand signalled to a green Chevrolet, the first vehicle in lane 1, that he would be next and gestured for the vehicle to begin moving forward.

Almost immediately the green Chevrolet leapt forward with its wheels spinning on the steel deck and its engine racing. As it accelerated quickly across the deck the deck-hand was forced to jump out of its path and the last vehicle in lane 3 was forced to make an emergency stop. The chief officer, who was looking down the car deck watching the progress of the traffic in lane 3, turned as the vehicle struck him in the thighs, picked him up with his upper body over the hood and his legs dragging underneath, carried him across the deck, crushing his hips and legs against the ramp railings. The chief officer fell to the car deck and lay with this lower body and legs on the finger flaps and his torso on the steel deck.

The vehicle continued up the ramp on its two right wheels, tearing off parts of its left front fender and strips of rubber from its left front tire, before landing on all four wheels part way up the ramp. Thick black smoke was seen pouring from the exhaust pipe before the vehicle finally stopped. Two nurses who were passengers on the ferry immediately begin administering first aid to the chief officer, being assisted later by crew members and a nurse from a vehicle on the terminal waiting area.

An ambulance and the police were summoned by radio from the vessel's wheel-house and an ambulance arrived 23 minutes later, followed closely by the RCMP.

The remainder of the traffic in Lane 1 was discharged and, after loading the Swartz Bay traffic, the ambulance boarded and travelled on the vessel to Swartz Bay where it arrived at approximately 1220. The chief officer was transferred to another ambulance and taken to Saanich Peninsula Hospital.

Findings

On the morning of August 5, 1989, a green 1978 Chevrolet Malibu Classic containing a driver and passenger, struck the chief officer of the ferry "BOWEN QUEEN" while at the dock at Fulford Harbour, Salt Spring Island, due to an uncontrolled acceleration of the vehicle, inflicting multiple injuries.

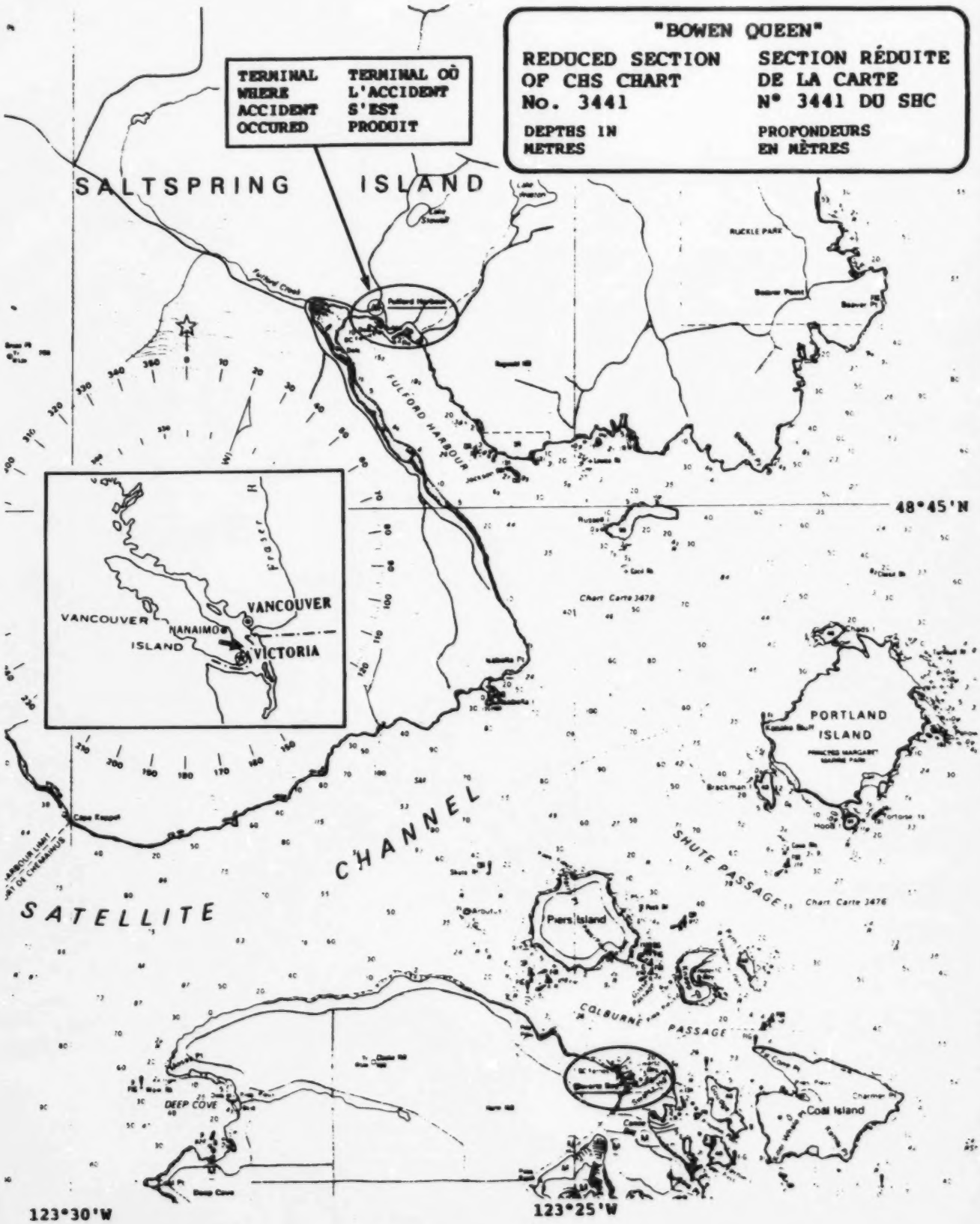
The most probable cause of the accident is the mistaken application of the driver's right foot to the vehicle's accelerator pedal rather than the brake pedal.

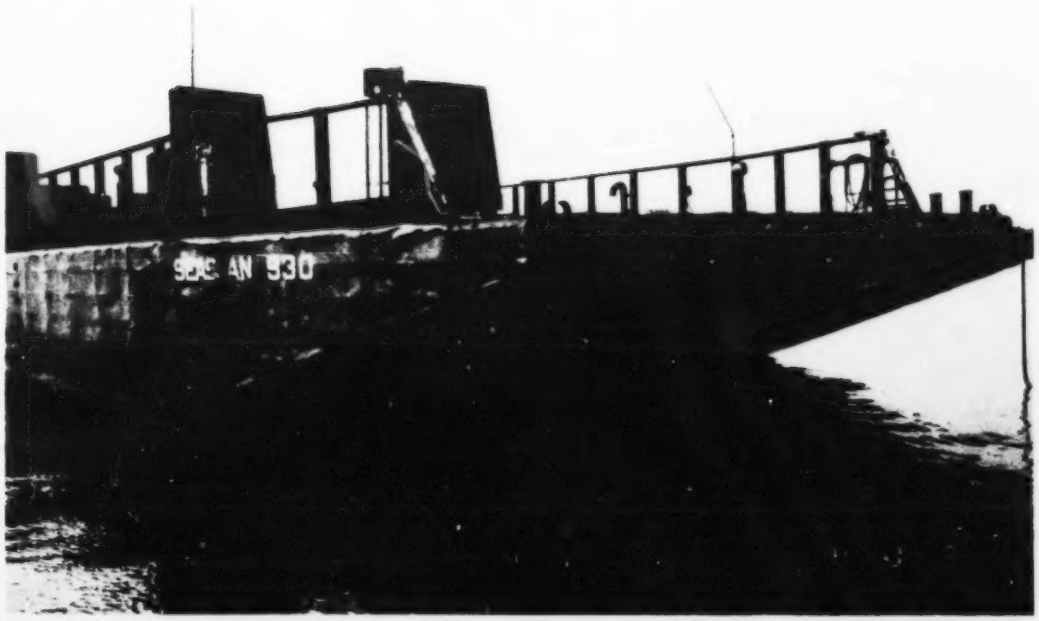
The high level of ambient noise on the car deck prevented the driver hearing the vehicle's transmission going heavily into "drive" and its high speed. It also prevented the chief officer from hearing the transmission engage, the high engine speed and the rear wheels spinning on the deck.

Other Findings

Apart from the wearing of traffic tunics, B.C. Ferries Operation Manual does not contain the requisite procedures and techniques designed to prevent or reduce the risk of employment injury on the car-decks of its ferries as required by 4(b) of the Safe Working Practices Regulations.

The vessel's first aid capability was inadequate for effective emergency treatment of the injuries the chief officer received.


"BOWEN QUEEN"
REDUCED SECTION OF CHS CHART No. 3441
SECTION RÉDUITE DE LA CARTE N° 3441 DU SHC
DEPTHS IN METRES
PROFONDEURS EN MÈTRES
TERMINAL WHERE ACCIDENT OCCURED
TERMINAL OÙ L'ACCIDENT S'EST PRODUIT
SALTSPRING ISLAND
FULFORD HARBOUR
VANCOUVER ISLAND
VANCOUVER
NANAIMO
VICTORIA
PORTLAND ISLAND
SATELLITE CHANNEL
SHUTE PASSAGE
COLBURNE PASSAGE
Piers Island
Coal Island
DEEP COVE
Chart Carte 3478
Chart Carte 3476
48°45'N
123°30'W
123°25'W



"SEASPAN 930"

"SEASPAN RIVAL"

"SEASPAN RIVAL"

Run down by barge and sunk, Vancouver Harbour, November 1, 1989.

Summary

The "SEASPAN RIVAL" is a 9 gross ton yarding tug built in 1968 in New Westminster, B.C., and registered in Vancouver, B.C. She is propelled by a single fixed-pitch propeller housed in a directional Kort nozzle. The main engine is directly controllable from either the wheel-house, the flying bridge above the wheel-house or the working console located at the starboard side of the engine-room casing beside the tow winch. All three stations are equipped with tow winch abort releases which when activated will allow the tow winch to spool free.

The "SEASPAN 930" is an unmanned, 3146 gross ton, flat decked rail car barge used to transport rail cars between Vancouver and Crofton on Vancouver Island, and between Vancouver and Seattle, Washington, U.S.A.

On the evening of November 1, 1989 the "SEASPAN RIVAL" with a crew of two on board, assisted in docking the "SEASPAN 930" at Burlington Northern Rail Slip in Vancouver and later that same evening after the barge had completed discharging and loading rail cars, she commenced towing the barge across Vancouver harbour en route to the British Columbia Rail Slip in North Vancouver.

The weather was fine and clear with light airs and a calm sea and the tide was ebbing.

The barge was being towed astern of the "SEASPAN RIVAL" on a short bridle and as the master conned the small tug from the flying bridge the deck-hand remained on board the barge.

Once clear of Ballantyne Pier on the Vancouver side of the harbour, the tug and tow were proceeding at 3 to 4 knots when the master throttled back on the main engine. Leaving the helm amidships he then left the flying bridge to change channels on the VHF radiotelephone in the wheel-house and to lengthen the towline for the trip across the harbour. As he entered the wheel-house the barge sheared off to port pulling the tug around 90° by the short bridle and trapping her under the rake of the barge's bow. The tug was then pushed over onto her beam ends barely allowing the master time to dive into the water as the tug was completely overrun. She eventually hung suspended underneath the barge until the bridle parted and she sank in 55 m of water.

The master was rescued by the "SEASPAN PLANET" and was taken to hospital in North Vancouver where he was treated for mild

hypothermia. The barge was taken under tow by the tug "SEASPAN CUTLASS" and delivered undamaged to her berth in North Vancouver. There was no appreciable amount of pollution as a result of this casualty.

The tug was later salvaged and towed to a local shipyard where damage was assessed at $120,000. The vessel was sold to other interests in the damaged condition in January, 1990.

Findings

On the evening of November 1, 1989 the small yarding tug "SEASPAN RIVAL" operated by a crew of two was run down by her towed barge "SEASPAN 930" and subsequently sank near Burnaby Shoal, Vancouver Harbour.

It would appear that the following factors contributed to the casualty:

- since the tow was to be of short duration the deck-hand was left onboard the barge and was therefore unable to tend the towing winch, and

- while towing on a short bridle at 3 to 4 knots the master left his flying bridge station to tend the tow winch and to change VHF channels, thereby losing control of his vessel.

Other Findings

Like many other small yarding vessels operating with only two crewmembers, the "SEASPAN RIVAL" is fitted with neither tow winch controls nor VHF controls on the flying bridge; which fact necessitates that procedures and techniques be agreed between the two man crew, and be strictly adhered to during towing operations.

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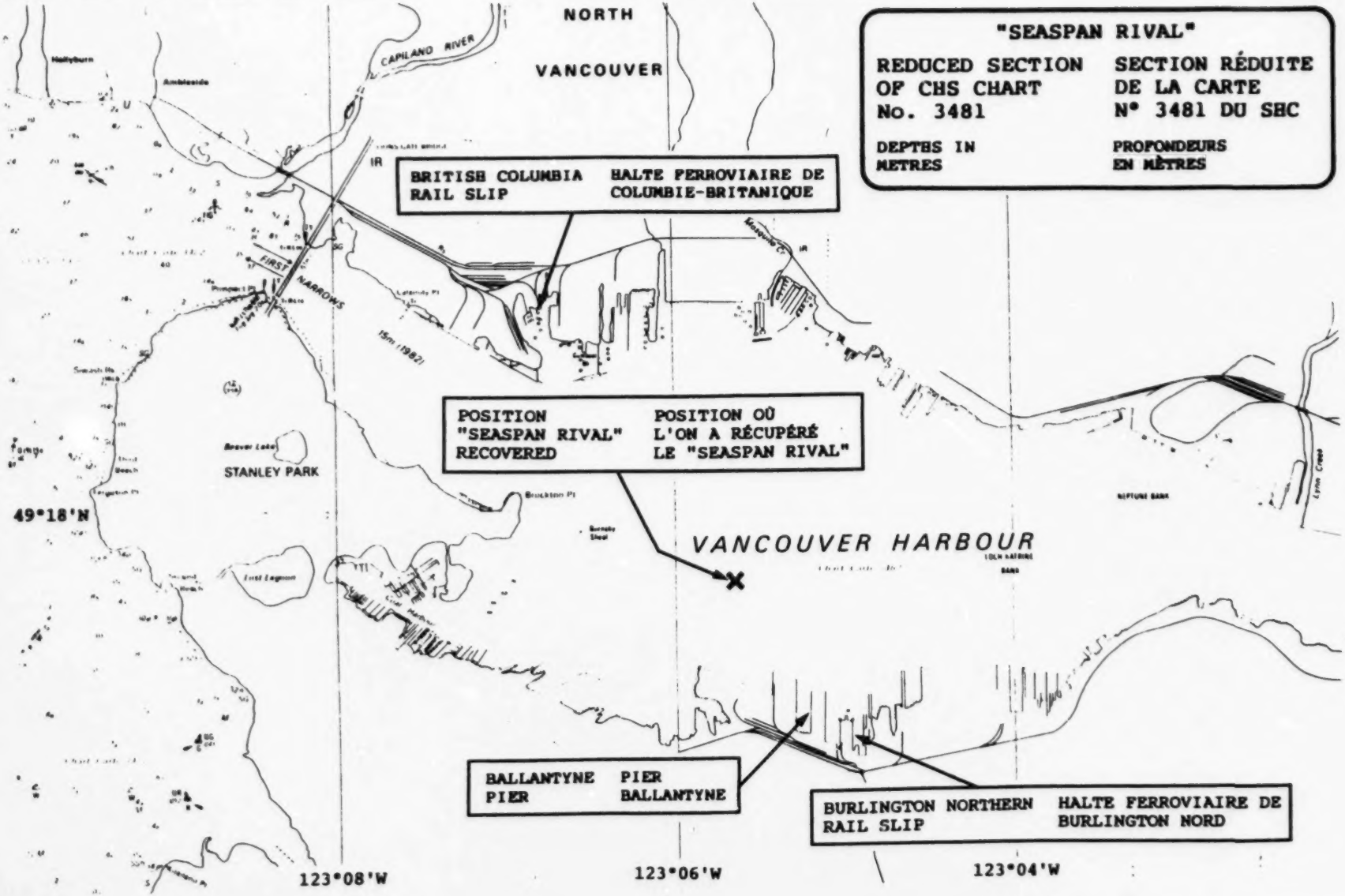
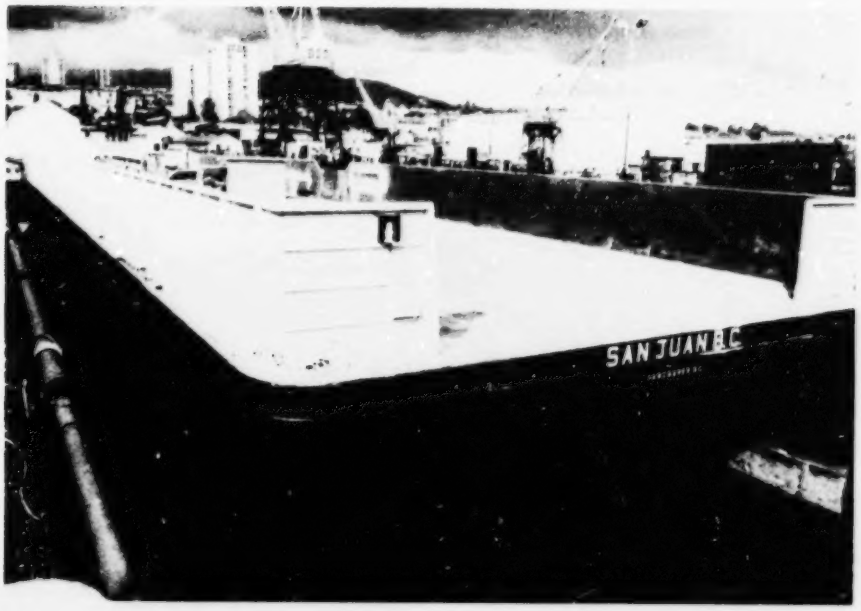
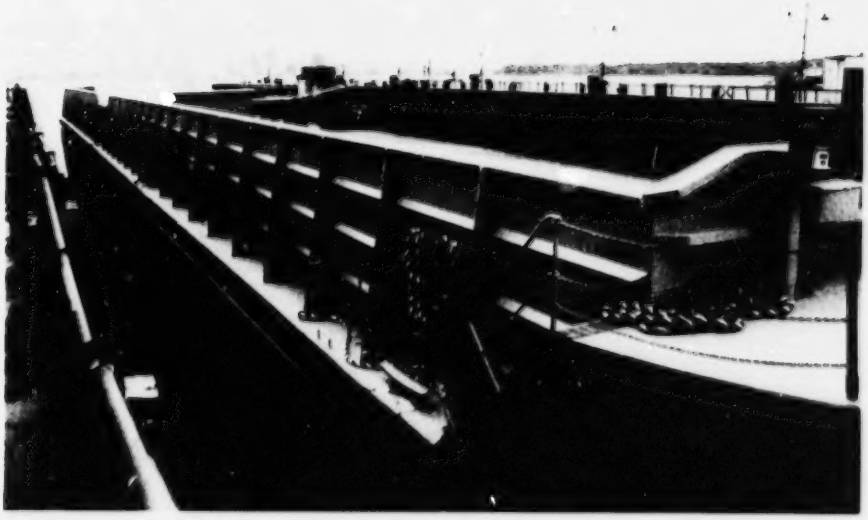


"SEASPAN RIVAL"

REDUCED SECTION OF CHS CHART No. 3481	SECTION RÉDUITE DE LA CARTE N° 3481 DU SHC
DEPTHS IN METRES	PROFONDEURS EN MÈTRES

"SAN JUAN B.C."





View of deck cargo. Vue du pont à ridelles.

"SAN JUAN B.C."

Capsize and sinking, Strait of Georgia, B.C., July 6, 1989

Summary

The 4,111 gross ton "SAN JUAN B.C." was an ocean-going barge built in 1967 and converted in 1989 to a deck-loading barge for the carriage of rock aggregate cargoes between ports on the west coast of Canada and to the United States. Her hull was subdivided by three transverse and two longitudinal watertight bulkheads and a watertight tank top, with six pairs of wing and double bottom tanks in way of a 70 m by 20 m redundant hold compartment.

At approximately 1730, July 5, 1989, the loading of some 10,000 short tons of crushed limestone rock was nearly completed when the barge was seen to be heeled slightly to port while alongside the loading wharf of a quarry in Beale Cove, Texada Island, B.C.

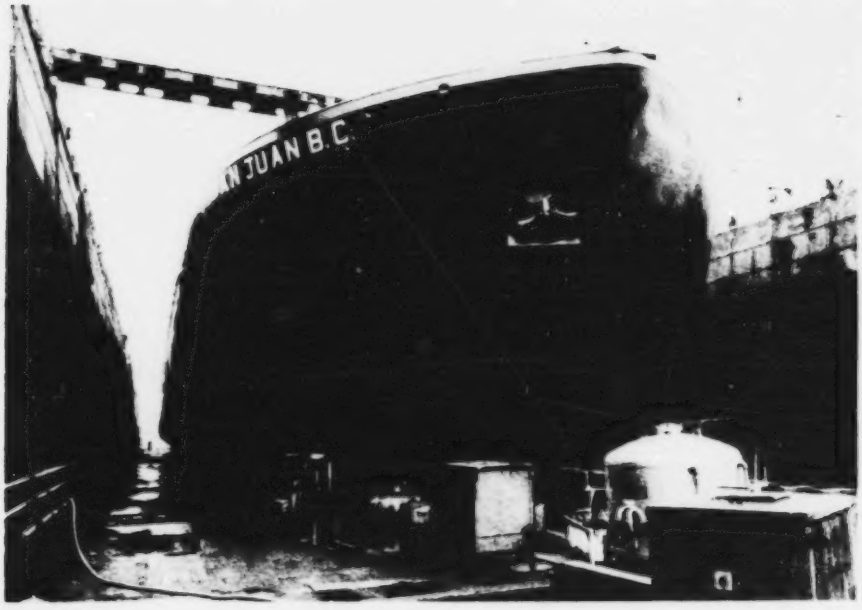
Loading was stopped and on finding a pair of port side wing and double bottom tanks were taking-in water, some 40 tons of deck cargo was transferred from port to starboard. On leaving the wharf under tow of the tug "JOSE NARVAEZ" the barge was virtually upright, however as the tanks continued to take-in water the barge again heeled to port and a further 30 tons of cargo was transferred from port to starboard.

When free-flooding of the tanks was considered to be complete the barge was virtually upright, and the voyage to Seattle, U.S.A. commenced in calm weather at about 2145. At 0020, July 6, while proceeding at approximately 7 knots the barge suddenly sheered to starboard and remained heeled to starboard about 30°-35°. The tow was slowed to 2.5 knots but the angle of heel increased as the deck cargo discharged to starboard, and within some 4-5 minutes the barge capsized remaining afloat in the inverted condition.

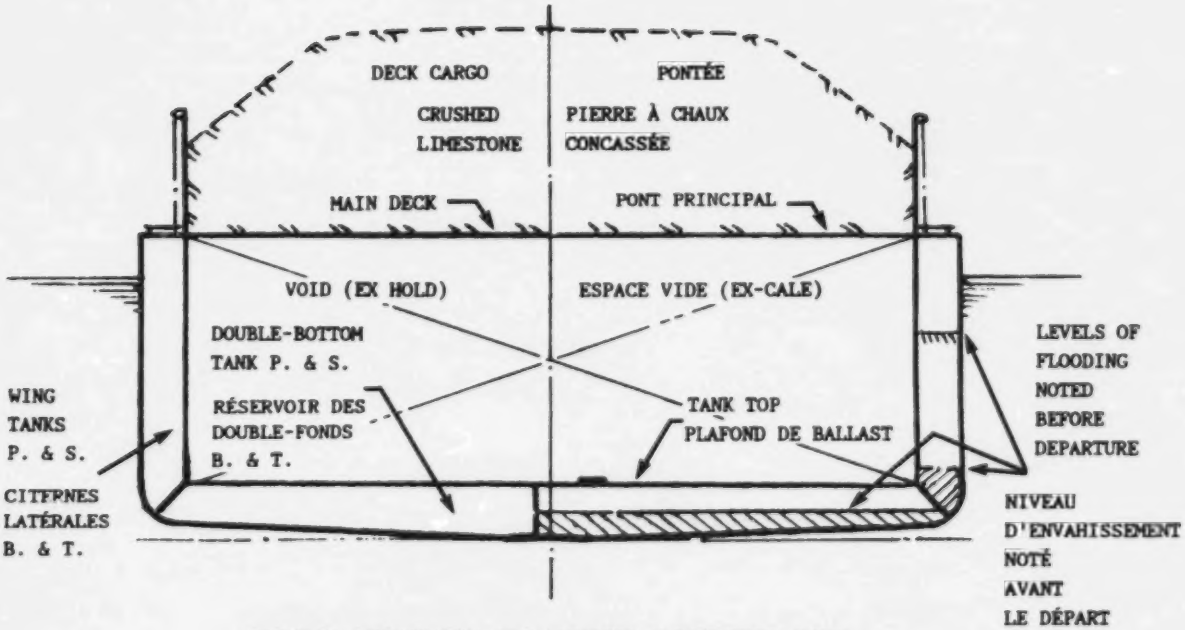
The tug maintained tension on the towline and continued towing at about 2.5 knots until 0447, by which time the barge had settled noticeably by the stern because of flooding from damage sustained to the deck plating as the cargo discharged, and the towing bridle then fell clear of the inverted bitts. At 0536, the barge sank stern first off Ballenas Island.

The barge sank in some 330 m (180 fathoms) of water and no attempts to raise her are contemplated; reportedly she had a market value of about $2,500,000, and the approximate value of the lost cargo was $25,000. There were no injuries to the tug personnel and insignificant pollution from the small quantity of diesel oil which escaped from six 22 l drums stowed in the forecastle of the barge.

"SAN JUAN B.C."



View of barge from forward.
Chaland vue de l'avant.



CROSS-SECTION OF BARGE LOOKING AFT
COUPE TRANSVERSALE DU CHALAND VUE VERS L'ARRIÈRE

Findings

In the early hours of July 6, 1989, the loaded Canadian deck-loading barge "SAN JUAN B.C." capsized to starboard and later sank in good weather conditions in the Strait of Georgia, B.C., while being towed by the tug "JOSE NARVAEZ", on a voyage from Beale Cove, Texada Island, B.C. to Seattle, U.S.A.

It would appear that the cause of the capsize was a loss of transverse stability brought about by the free-surface effect and gravitation to starboard of an accumulation of floodwater inside the hull which, in turn, led to a shift of part of the deck cargo.

While the actual cause of the flooding and extent, magnitude, or location of the loose water cannot be precisely determined, the most likely contributing factors to the capsize and sinking were:

- the shell plating at the port side turn of bilge in way of N°3 P DB tank and N°3 P wing tank was damaged and allowed an ingress of water;

- N°3 P DB tank was pressed-up with floodwater as a result of the ingress, subjecting the tank top plating to a static pressure head such that existing and/or recently incurred fractures allowed seawater to flow into the redundant hold compartment;

- the weight, trimming and free-surface effects of the accumulated floodwater on the tank top reduced the freeboard, increased the after trim and virtually eliminated the barge's initial transverse stability;

- the sudden gravitation of slack floodwater to starboard, the impetus of which caused the barge to heel, the deck machinery to shift to starboard and the starboard face of the deck cargo to become immersed, so as to prevent recovery;

- the action of the sea which eroded the starboard face of the partially immersed deck cargo;

- the continued shift due to erosion and eventual total discharge of deck cargo which overcame the barge's transverse stability, causing her to capsize; and

- flooding of the inverted barge by way of damage to the submerged main deck incurred as the cargo discharged, which continued until she lost all reserve buoyancy and sank stern first.

Other Findings

The structural and watertight integrity of the longitudinal bulkheads, margin plates, divisions and tank tops of the wing and double bottom tanks were not proven by pressure head testing on completion of the barge's conversion, or after shell and tank top damage repairs completed June 29, 1989.

No cause was determined for the shell plating fractures in way of N°3 P DB tank, nor was the casualty of June 25, 1989, reported in accordance with the requirements of the Shipping Casualties Reporting Regulations.

Detailed and revised trim and stability data for the converted barge were not prepared, nor were they required by regulation.

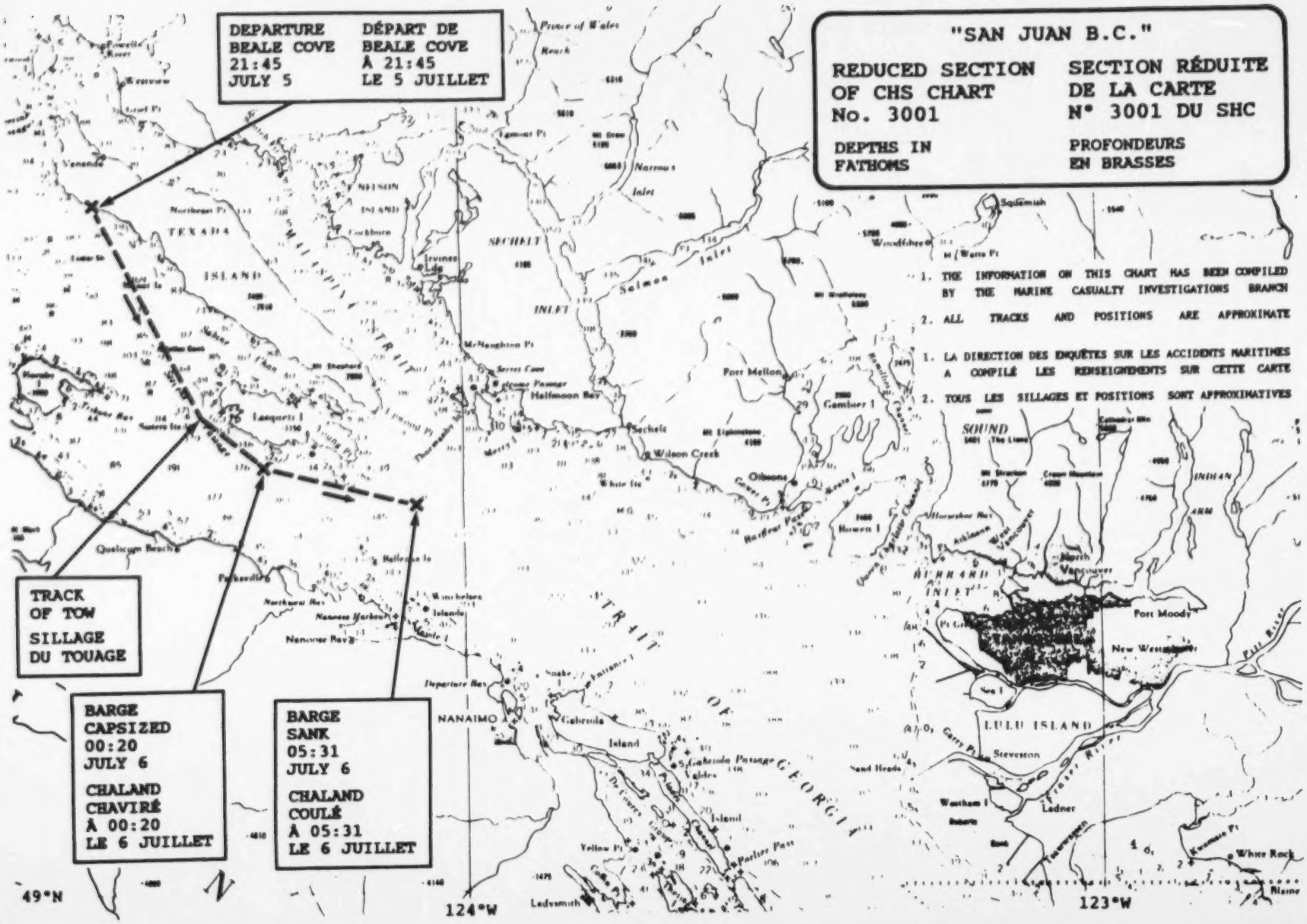
The converted barge did not have an assigned Load Line, nor was one required by regulation.

The barge was not inspected by the Ship Safety Branch of the Canadian Coast Guard, nor was such inspection required by regulation.

When loading was curtailed N°3 P DB tank and N°3 P wing tank were only partially flooded, and there is no evidence that any other significant quantity of slack water was present at that time.

No internal inspection was made to ascertain the presence of floodwater on the tank top, or other ingress of water, after the flooding of the damaged tanks was considered to be complete.

The barge was taken to sea with a known hull leakage problem and this problem was not fully investigated.


DEPARTURE
BEALE COVE
21:45
JULY 5
DÉPART DE
BEALE COVE
À 21:45
LE 5 JUILLET
"SAN JUAN B.C."
REDUCED SECTION
OF CHS CHART
No. 3001
SECTION RÉDUITE
DE LA CARTE
N° 3001 DU SHC
DEPTHS IN
FATHOMS
PROFONDEURS
EN BRASSES
1. THE INFORMATION ON THIS CHART HAS BEEN COMPILED BY THE MARINE CASUALTY INVESTIGATIONS BRANCH
2. ALL TRACKS AND POSITIONS ARE APPROXIMATE
1. LA DIRECTION DES ENQUÊTES SUR LES ACCIDENTS MARITIMES A COMPILÉ LES RENSEIGNEMENTS SUR CETTE CARTE
2. TOUS LES SILLAGES ET POSITIONS SONT APPROXIMATIVES
TRACK
OF TOW
SILLAGE
DU TOUAGE
BARGE
CAPSIZED
00:20
JULY 6
CHALAND
CHAVIRÉ
À 00:20
LE 6 JUILLET
BARGE
SANK
05:31
JULY 6
CHALAND
COULÉ
À 05:31
LE 6 JUILLET
NANAIMO
49°N
124°W
123°W

"CINERARIA"

"ZIEMIA OPOLSKA"

"CINERARIA"/"ZIEMIA OPOLSKA"

**Collision in the Canal de la Rive Sud,
November 23, 1989**

Summary

The "CINERARIA" is a 17,066 gross ton, Liberian-registered, geared bulk carrier with bridge and accommodation aft, build in 1983. In the early hours of November 23, 1989, she was upbound in the St. Lawrence Seaway bound for Toronto with a cargo of steel and general cargo, drawing 7.50 m forward and 7.62 m aft. Her Seaway pilot boarded at Saint Lambert lock at 0130 and she began her transit of the Canal de la Rive Sud in fine and clear weather conditions, with the wind light from the NE. After clearing Côte Sainte-Catherine lock she was advised at 0338, by Seaway Control, Beauharnois, of the downbound "ZIEMIA OPOLSKA".

The "ZIEMIA OPOLSKA" is a 15,667 gross ton, Polish-registered bulk carrier with bridge and accommodation aft, build in 1973 and she was bound from Thunder Bay to Quebec and Antwerp with a cargo of flax, her departure draft having been 7.87 m fore and aft. She changed pilots at the Upper Beauharnois lock and on passing St. Nicholas island at 0353 she was advised of the presence of the "CINERARIA".

At 0355, the pilots of both vessels conversed and agreed to meet above the CPR bridge. This is a location where it is Seaway policy that vessels avoid meeting but it is preferred by pilots, reportedly because with the vessels turning on the bend in that area the passing manoeuvre is made easier. In order for the meeting to occur at the agreed location, because of their respective distances from that point, the "ZIEMIA OPOLSKA" had to reduce speed to bare steerage-way while the "CINERARIA" had to increase her speed above the prescribed 6 knot limit for that section of the canal. The masthead lights of each vessel were sighted by the other at a distance of approximately one mile, shortly after the "CINERARIA" passed beneath the CPR bridge. The "ZIEMIA OPOLSKA" was held with bare steerage-way close to a retaining wall on the south shore of the canal and as the "CINERARIA" approached she was noted to be also favouring the south shore. In fact the "CINERARIA" began to feel the effect of "bank suction" and with control of the vessel temporarily lost, as he tried to re-align her for the meeting the pilot on the "CINERARIA" called the "ZIEMIA OPOLSKA" to advise her that a collision appeared inevitable. With that, the master of the "ZIEMIA OPOLSKA" ordered an emergency 'full astern' to lessen the impact.

The vessels collided at approximately 0419 and both sustained minor structural damage to the after end of the forecastlehead and surrounding components. The collision was reported to Seaway Control, Beauharnois at 0420. The "ZIEMIA OPOLSKA" was directed to berth at Côte Saint-Catherine wharf and the "CINERARIA" to

anchor when clear of the canal. Both vessels were allowed to proceed to their destinations following an inspection by the Seaway Authorities.

Findings

The Liberian vessel "CINERARIA" and the Polish vessel, "ZIEMIA OPOLSKA" collided in the Canal de la Rive Sud during darkness and fine weather conditions, due to an error in handling the vessels whilst both were under the conduct of Saint Lawrence Seaway pilots.

It would appear that the following factors contributed to the casualty:

Both vessels

- The pilots had agreed to meet in the Kahnawake curve rather than on a straight stretch of the canal. Although it is Seaway policy that meetings in the curve should be avoided, the arrangement, monitored on VHF radiotelephone by Seaway Control, was not opposed.

"CINERARIA"

- was affected by bank suction immediately prior to the collision;

- control of the vessel was temporarily lost due to a misunderstood helm order; and

- a degree of fatigue may have affected the pilot's reactions.

"ZIEMIA OPOLSKA"

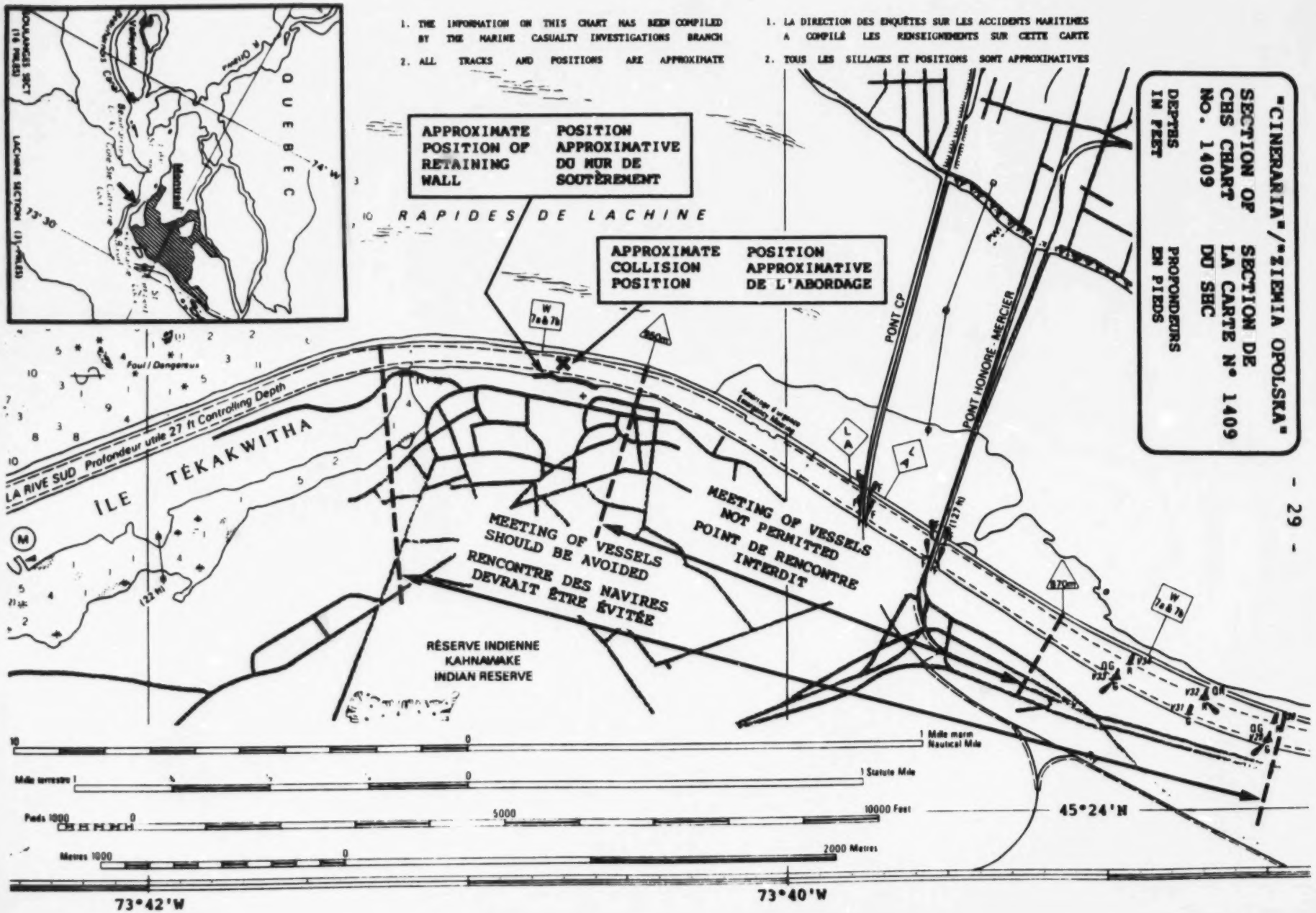
- was unable to take evasive action other than going full astern due to the rapid development of the situation.

Other Findings

Both pilots had agreed upon meeting above the CPR bridge which, although an area where meetings should be avoided, is preferred by the pilots because of a slight increase in the channel width, and the automatic need for altering course.

To rendezvous at the agreed position, the "CINERARIA" of necessity, exceeded the mandatory speed limit in the canal whilst the "ZIEMIA OPOLSKA" maintained steerage way only.

The pilot of the "CINERARIA" attributed his fatigue to extraneous activities between pilotage assignments.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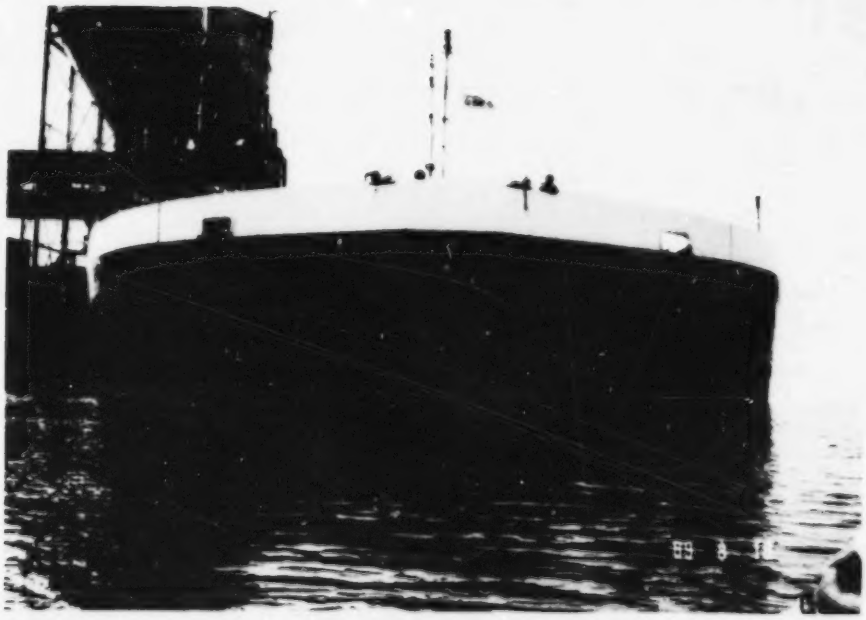
2. TOUS LES SILLAGES ET POSITIONS SONT APPROXIMATIVES
"CINERARIA"/"ZIEMIA OPOLSKA"
SECTION OF CHS CHART No. 1409
SECTION DE LA CARTE N° 1409 DU SHC
DEPTHS IN FEET
PROFONDEURS EN PIEDS
APPROXIMATE POSITION OF RETAINING WALL
POSITION APPROXIMATIVE DU MUR DE SOUTÈNEMENT
APPROXIMATE COLLISION POSITION
POSITION APPROXIMATIVE DE L'ABORDAGE
RAPIDES DE LACHINE
PONT CP
PONT HONORÉ-MERCIER
LA RIVE SUD Profondeur utile 27 ft Controlling Depth
ILE TÉKAKWITHA
Foul / Dangereux
MEETING OF VESSELS SHOULD BE AVOIDED
RENCONTRE DES NAVIRES DEVRAIT ÊTRE ÉVITÉE
MEETING OF VESSELS NOT PERMITTED
POINT DE RENCONTRE INTERDIT
RÉSERVE INDIENNE KAHNAWAKE INDIAN RESERVE
1 Mile marin Nautical Mile
1 Statute Mile
10000 Feet
2000 Metres
45°24'N
73°42'W
73°40'W
QUEBEC
Montreal

"HAPPY HOOKER"



Forward end of "CLARKSON CARRIER".
L'avant du "CLARKSON CARRIER".

"PETITE FORTE"-"CLARKSON CARRIER"/"HAPPY HOOKER"

Collision off Clarkson Harbour, Lake Ontario, August 13, 1989

Summary

The "PETITE FORTE" is a 370 gross ton, Bermudan - registered tug developing 3090 kW. She pushes the 4,117 gross ton barge "CLARKSON CARRIER", also of Bermudan registry and, since late 1986, this tug/barge unit has been engaged in the cement trade in Lake Ontario.

At about 0900 on August 13, 1989, the unit cleared the berth at Clarkson, loaded with a cargo of bulk cement and shortly after she had set course on the passage to Oswego, New York, the existing poor visibility reduced to about 15 m in dense fog. The mate joined the master on the bridge of the tug while two crew members washed down the deck of the barge. At about 0946, the two crew members heard shouting from over the port side and saw an overturned pleasure craft with five people clinging to it; the craft is now known to be the "HAPPY HOOKER".

The 5.48 m aluminum open boat "HAPPY HOOKER" with her operator, had been hired by a party of 3 adults and one juvenile to participate in a local salmon fishing derby. The boat had left Port Credit at approximately 0615 to fish in that general area but there were a reported 80 to 100 other small craft in that vicinity and it had headed towards Clarkson. The tug/barge unit then, apparently, struck the "HAPPY HOOKER" astern, slewing it around 180° and capsizing it, throwing the five occupants into the water. The father of the boy had put a lifejacket on his son when the sound of the bow wave of the "CLARKSON CARRIER" was heard closing in the fog but none of the others had donned a lifejacket and they held onto the overturned boat. The tug/barge unit was stopped but remained at some distance being concerned about manoeuvring with people in the water. The five were uninjured and were rescued when their shouts were heard by another pleasure craft but not before they had been in the 11°C water for about 50 minutes.

Findings

The Bermudan-registered barge "CLARKSON CARRIER" being pushed by the Bermudan-registered tug "PETITE FORTE" collided with the Canadian pleasure craft "HAPPY HOOKER" in daylight hours, during a period of dense fog.

The pleasure craft became snarled and subsequently capsized throwing its five occupants into the sea.

It would appear that the following factors contributed to this casualty:

Tug/Barge Combination

- the speed of the tug/barge was not a safe speed whilst navigating in conditions of restricted visibility and with a known heavy concentration of small vessels in the area;

- a proper look-out was not maintained in that no look-out was posted at the forward end of the barge; and

- no concerted attempt was made to relocate a close target on the PPI once it had disappeared from the screen.

"HAPPY HOOKER"

- did not cease fishing activities upon hearing a loud fog signal in her immediate vicinity, and

- was not equipped with a radar reflector.

Both Vessels

- made no attempt to contact one another with their respective VHF radiotelephones.

Other Findings

Due to the immense difference in size and construction between the "CLARKSON CARRIER" and the "HAPPY HOOKER", it was not immediately known aboard the "PETITE FORTE" that a collision had taken place.

The fact that the survivors' shouts for help were heard by those aboard the "CLARKSON CARRIER" at the time was fortuitous.

As rescue vessels were known to be en route to the area, the "PETITE FORTE" did not detach from the "CLARKSON CARRIER" and conduct her own search because of the time delay involved. However, it would have been prudent to have launched the motor rescue boat given the prevailing circumstance.

The weather forecast made no mention of fog.

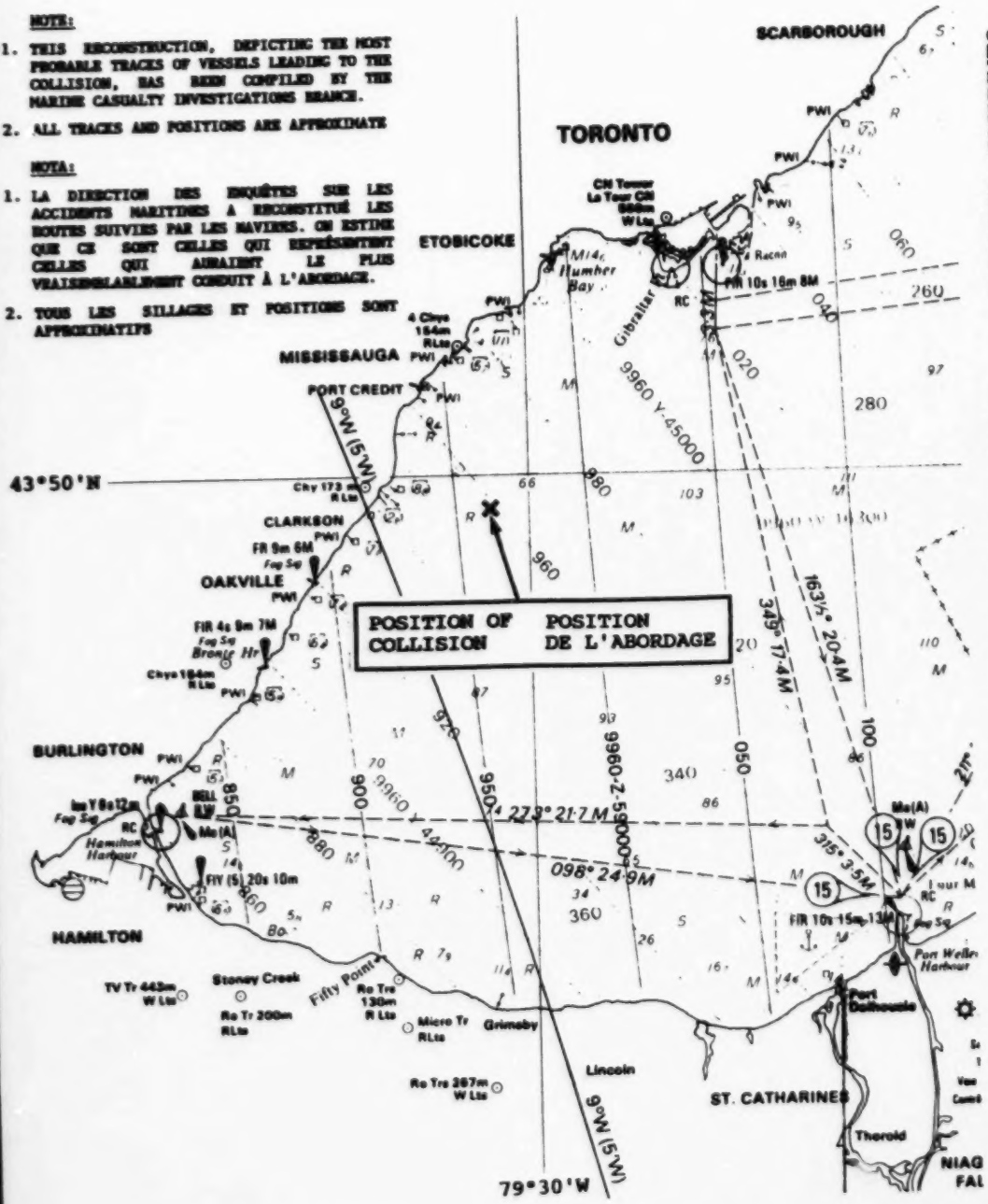
The organizers of the salmon derby did not contact the Coast Guard with a view to having a Notice to Shipping promulgated.

NOTE:

1. THIS RECONSTRUCTION, DEPICTING THE MOST PROBABLE TRACKS OF VESSELS LEADING TO THE COLLISION, HAS BEEN COMPILED BY THE MARINE CASUALTY INVESTIGATIONS BRANCH.
2. ALL TRACKS AND POSITIONS ARE APPROXIMATE

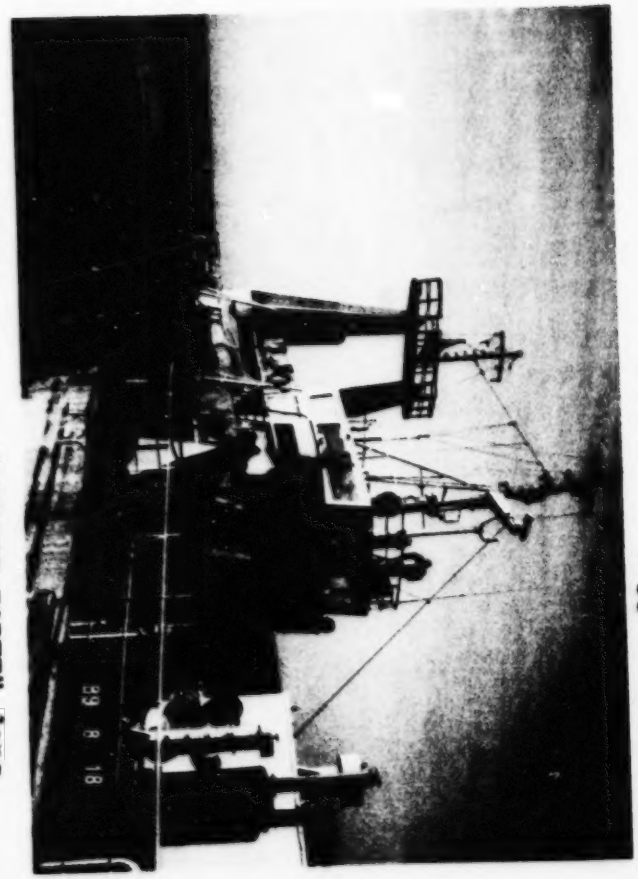
NOTA:

1. LA DIRECTION DES ENQUÊTES SUR LES ACCIDENTS MARITIMES A RECONSTITUÉ LES ROUTES SUIVIES PAR LES NAVIRES. ON ESTIME QUE CE SONT CELLES QUI REPRÉSENTENT CELLES QUI AURAIENT LE PLUS VRAISEMBLABLEMENT CONDUIT À L'ABORDAGE.
2. TOUS LES SILLAGES ET POSITIONS SONT APPROXIMATIFS



"PETITE FORTE" in notch at stern of "CLARKSON CARRIER".

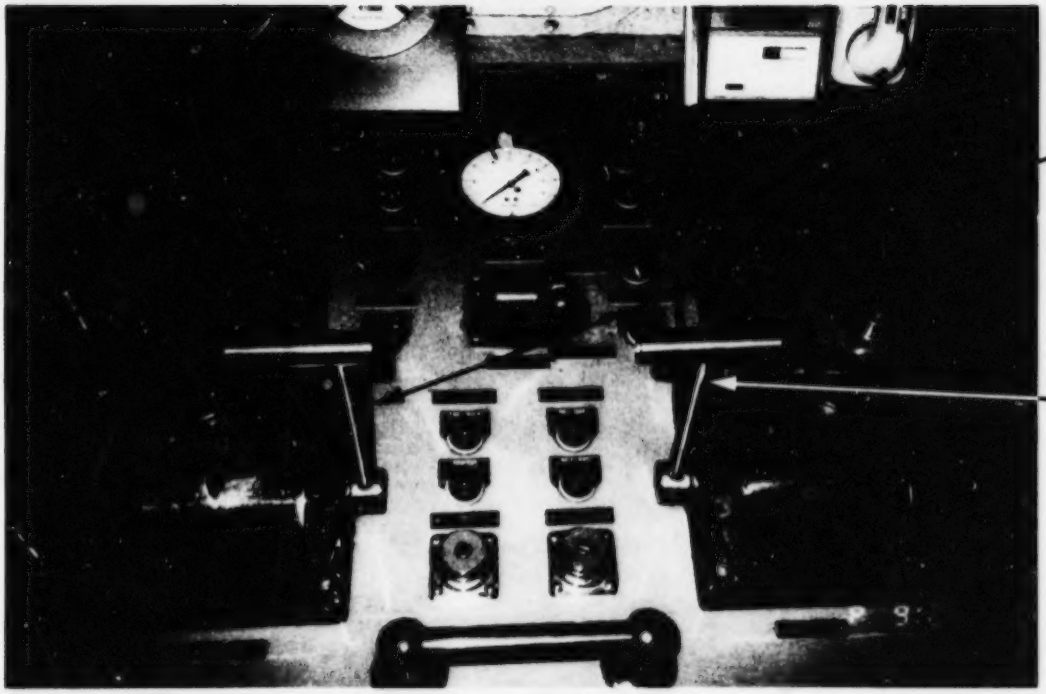
"PETITE FORTE" dans l'encoche du couronnement arrière du "CLARKSON CARRIER"



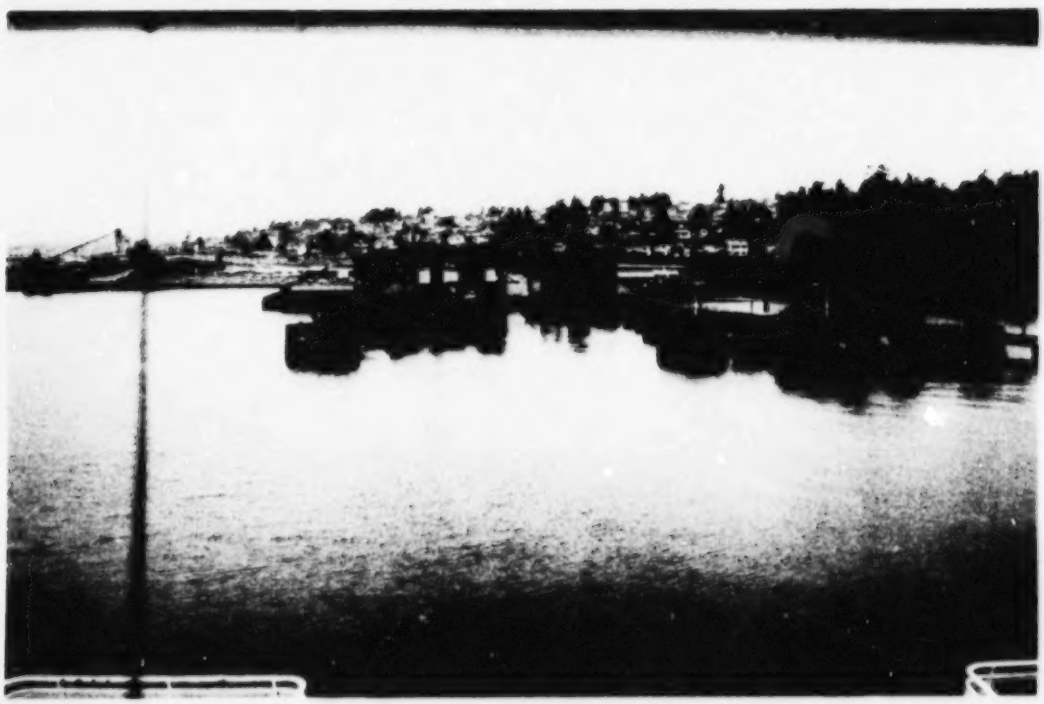
"PETITE FORTE"-"CLARKSON CARRIER"
"HAPPY HOOKER"

SECTION OF CHS CHART No. 2000	SECTION DE LA CARTE N° 2000 DU SHC
DEPTHS IN METRES	PROFONDEURS EN MÈTRES

"QUEEN OF ALBERNI"



Control console on bridge.
Console des commandes sur la passerelle.



Departure Bay terminal. Terminal de Departure Bay.

"QUEEN OF ALBERNI"

Struck berth heavily, Nanaimo, B.C., June 16, 1989.

Summary

The "QUEEN OF ALBERNI" is a double-ended RoRo vehicle/passenger ferry of 5,863 gross tons operating on a scheduled run between Horseshoe Bay, West Vancouver and Departure Bay, Nanaimo, B.C.; a distance of 30 miles with a crossing time of 1 hour 35 minutes. There is a navigating bridge at each end of the vessel and the 'forward' end is considered to be that end from which the vessel is being navigated. The vessel's main propulsion consists of two diesel engines, with a total output of 11,860 b.h.p. driving a single controllable-pitch propeller at each end through two gear boxes and four pneumatic clutches. The main engines and shafts are uni-directional and ahead and astern thrust is obtained by blade pitch adjustments. The vessel has a rudder at each end.

For normal navigation between ports the vessel is operated in Mode 1 in which all power is transmitted to the aft propeller and bridge control is by a "T" handle controller. For manoeuvring, the vessel is placed in Mode 2 in which control of the forward propeller is achieved by an "L" handle controller and separate control of the aft propeller is accomplished using the "T" handle controller. When utilizing the "L" handle controller in Mode 2 an ahead setting on the propeller pitch gives the vessel a braking effect whilst an astern setting assists in propelling the vessel forward.

On the morning of June 16, 1989, as the "QUEEN OF ALBERNI" approached the terminal at Horseshoe Bay, the vessel temporarily and unaccountably dropped out of Mode 2 but was safely docked in Mode 1. When the vessel sailed again for Departure Bay with a full complement of 792 passengers and 174 motor vehicles on board she was 29 minutes behind her scheduled sailing time of 1300. As the "QUEEN OF ALBERNI" approached Departure Bay all appeared normal on the navigation bridge until the vessel was approximately 18 metres from the outer dolphin at the approach to No. 3 dock when an ahead setting was selected on the "L" handle to increase braking power and instead the vessel increased speed. It was then noted that the forward propeller registered zero pitch and zero RPM. To compensate, the "T" handle controller was neutralized and placed into a maximum astern setting however, the navigation bridge pitch gauge continued to register ahead pitch increasing to 3/4 ahead pitch while the wrong way alarm commenced ringing for the after propeller. The "L" handle was placed full down to a maximum ahead pitch setting in the hope of getting maximum braking power.

With a striking inevitable the master sounded the ship's whistle as a warning to both the ship's complement and the dock staff and placed both control levers in the neutral position. The

navigation officer broadcast a warning on the P/A system and telephoned the engine-room, however with no time for remedial action, the bow of the "QUEEN OF ALBERNI" struck the mid-part of No. 3 berth vehicle ramp with considerable impact at 1501 at an estimated speed of 8 knots. The vessel bounced back striking and damaging the wing walls.

As a result of the striking, 17 passengers and 7 crew members were injured, five of whom were taken to hospital; 13 motor vehicles were damaged. The "QUEEN OF ALBERNI" sustained minor damage forward with repairs costing $35,000 and the ferry dock sustained extensive damage with repairs costing approximately $750,000. The "QUEEN OF ALBERNI" was taken out of service to carry out repairs, however, the cause of the reported control malfunctions was never determined. The vessel underwent dock and sea trials satisfactorily and returned to service June 17, 1989.

Findings

On the afternoon of June 16, 1989, the B.C. Ferry corporation Ro Ro vehicle/passenger ferry "QUEEN OF ALBERNI", on her scheduled run from Horseshoe Bay to Departure Bay, was approaching No. 3 berth Departure Bay when she apparently experienced propulsion control malfunctions resulting in the vessel striking the centre of No. 3 loading ramp with considerable impact.

Although all the statements were not consistent, the bulk of the evidence is that the control malfunctions manifested themselves such that No. 1 CPP went to zero pitch and No. 2 CPP went 3/4 full ahead, contrary to the bridge controller positions.

The vessel was slowed down to an acceptable approach rate with bare steerage way being maintained prior to accelerating rapidly to an estimated 8 knots.

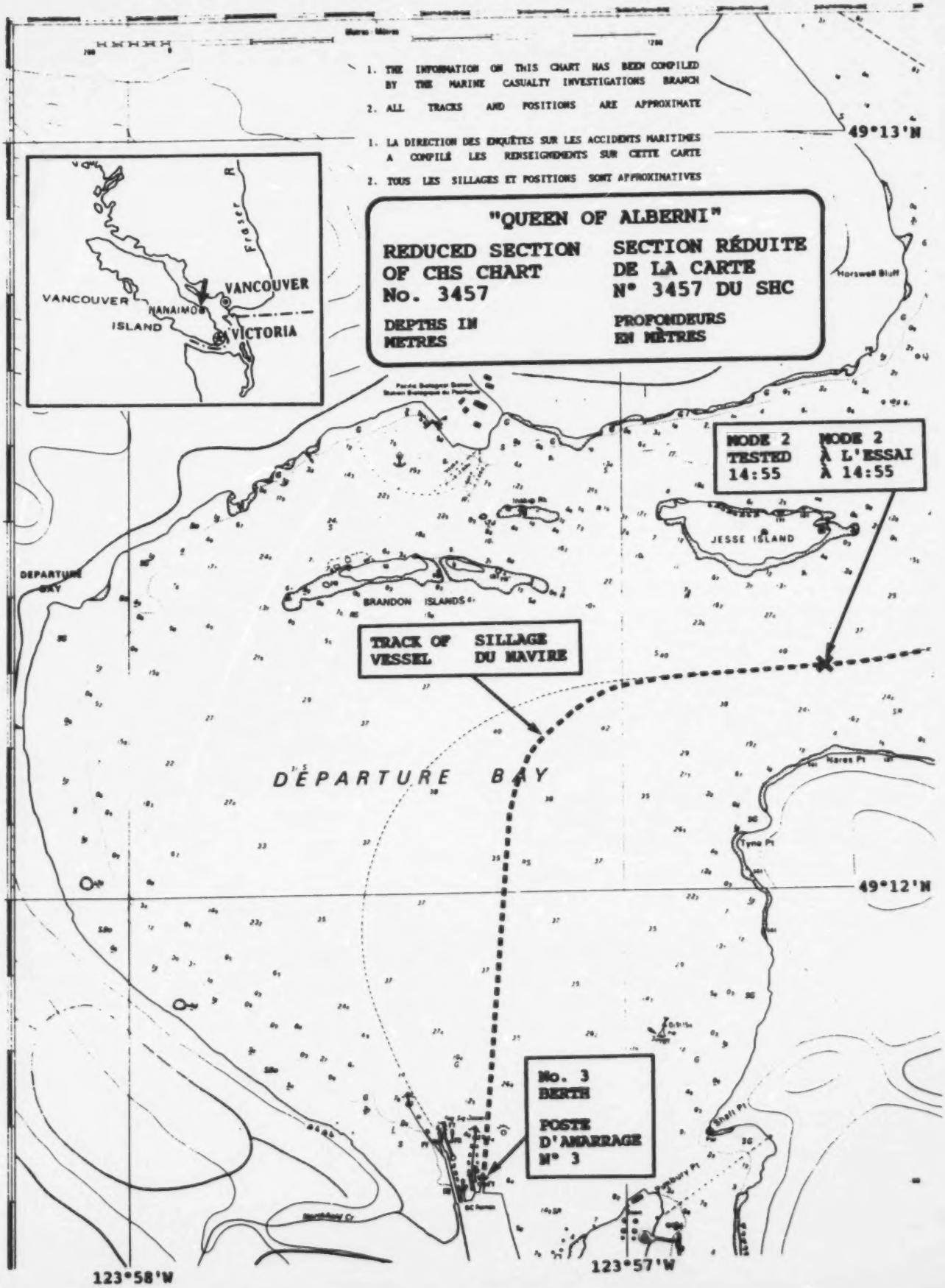
The vessel had dropped out of Mode 2 on two recent occasions for no accountable reason.

After investigation and trials the cause of the control malfunctions has not been determined to date.

Other Findings

Passengers were warned by an announcement on the P/A system, emergency whistles, and where applicable by crew members, of the impending heavy impact.

Crew members, in particular IFA attendants, treated injured persons in a professional manner.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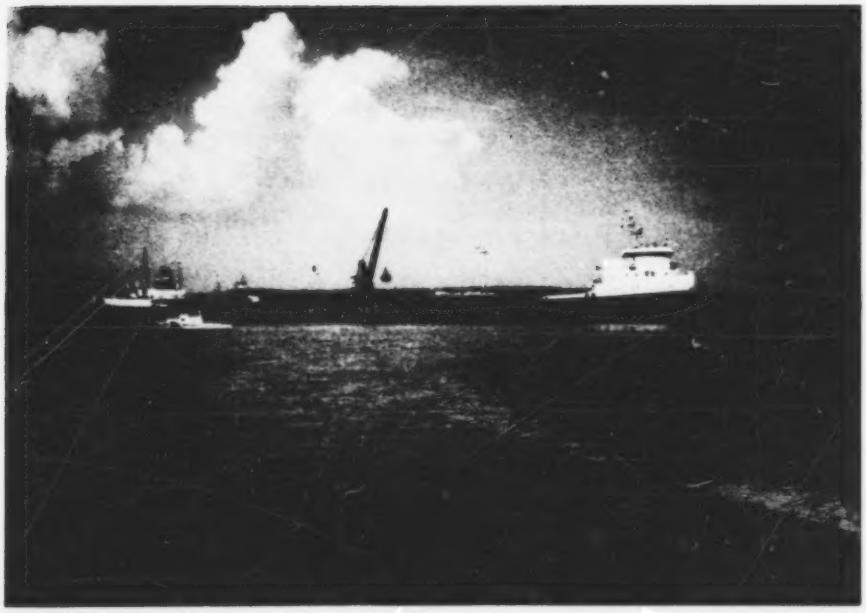
"QUEEN OF ALBERNI"
REDUCED SECTION OF CHS CHART No. 3457
SECTION RÉDUITE DE LA CARTE N° 3457 DU SHC
DEPTHS IN METRES
PROFONDEURS EN MÈTRES
Fraser R.
VANCOUVER
VANCOUVER ISLAND
NANAIMO
VICTORIA
MODE 2 TESTED 14:55
MODE 2 À L'ESSAI À 14:55
TRACK OF VESSEL
SILLAGE DU NAVIRE
No. 3 BERTH
POSTE D'AMARRAGE N° 3
DEPARTURE BAY
JESSE ISLAND
BRANDON ISLANDS
DEPARTURE BAY
49°13'N
49°12'N
123°58'W
123°57'W

"BLACK BAY"



Vessel aground. Navire échoué.

Cargo being lightered.
Transbordement de la cargaison.

"BLACK BAY"

Grounding in St. Marys River, August 11, 1989.

Summary

The "BLACK BAY" of 17,848 gross tons, is a typical Great Lakes bulk carrier with the bridge and associated accommodation forward and the main accommodation and engine-room aft. She was built in Collingwood, Ont., in 1963 and is registered in Montreal, Que.

On the morning of August 11, 1989, she was in the St. Marys River downbound from Superior, Wis, with a cargo of 24,600 tons of iron-ore pellets in her 6 holds destined for Hamilton, Ontario. Her departure draught had been 7.79 m forward and 7.95 m aft and she had an uneventful passage across Lake Superior but with some periods of restricted visibility. There had been several small fog patches again earlier that morning but at 0725 as the "BLACK BAY" entered Munuscong Lake it was clear with a light southerly wind and the master handed the conduct of the vessel over to the OOW.

Both radar sets were reported to be on and operating, and the vessel, with a quartermaster at the wheel, was on a course of 128°(T) and (G) heading on the Hay Point ranges and moving through the water at an estimated 9 knots. At about 0745, a shallow fog bank obliterated the buoys and several small craft in the area but the upper portion of junction light '21', around which the vessel would normally alter course, was seen by both the OOW and the QM. At about this time the bosun came up to the wheel-house for the day's work orders and there was a brief conversation between him and the OOW.

When the fog cleared, shortly before 0750, buoy '20' was seen to be 10°-15° on the starboard bow at an estimated distance of 60 m and the wheel was put hard-a-starboard and the engine speed reduced. However, the "BLACK BAY" ran out of the channel and grounded at 0750, at which time the main engine was stopped.

Soundings revealed that No. 1 port double bottom tank was holed and as attempts to contain the inflow of water were ineffective, the tank was allowed to become tidal. Under the supervision of Canadian and U.S. authorities, the vessel having grounded in U.S. waters, some 1900 t of cargo were lightered and with the assistance of four tugs the "BLACK BAY" refloated at 1620 on August 12, when she proceeded to an anchorage for a diver's inspection. After re-loading the discharged cargo she was cleared by the authorities and left the anchorage at 2045, August 13, to proceed to Hamilton, where she arrived on August 16. The cost of subsequent repairs was reported to be US $2.1 million for the extensive bottom damage involved.

Findings

The Canadian laker "BLACK BAY" grounded due to an error in navigation during conditions of daylight and good visibility though immediately preceded by a period of shallow fog.

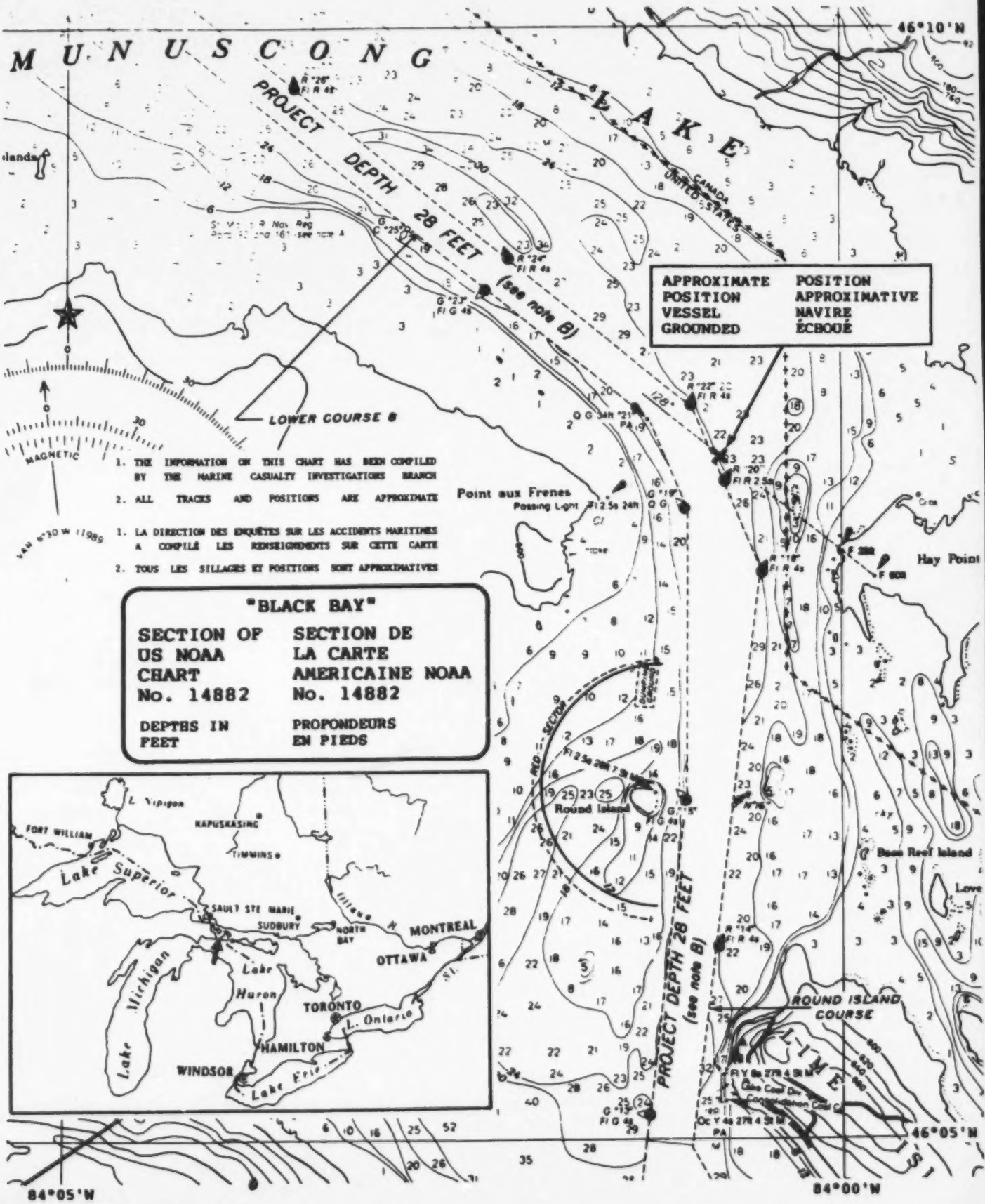
It would appear that the following factors contributed to this casualty:

- the vessel overran her position of course alteration by approximately 3 cables;
- full engine speed was maintained during conditions of restricted visibility at a critical position of course alteration;
- the position and progress of the vessel were not effectively monitored by radar during the conditions of restricted visibility;
- other than the QM, the OOW was the sole person on the bridge, in the shallow fog conditions which prevailed, having the responsibilities of attending to the navigation and the keeping of a look-out, contrary to the practices of good seamanship, and
- the attention to the conduct of the vessel by the OOW was temporarily diverted by a conversation with another crew member.

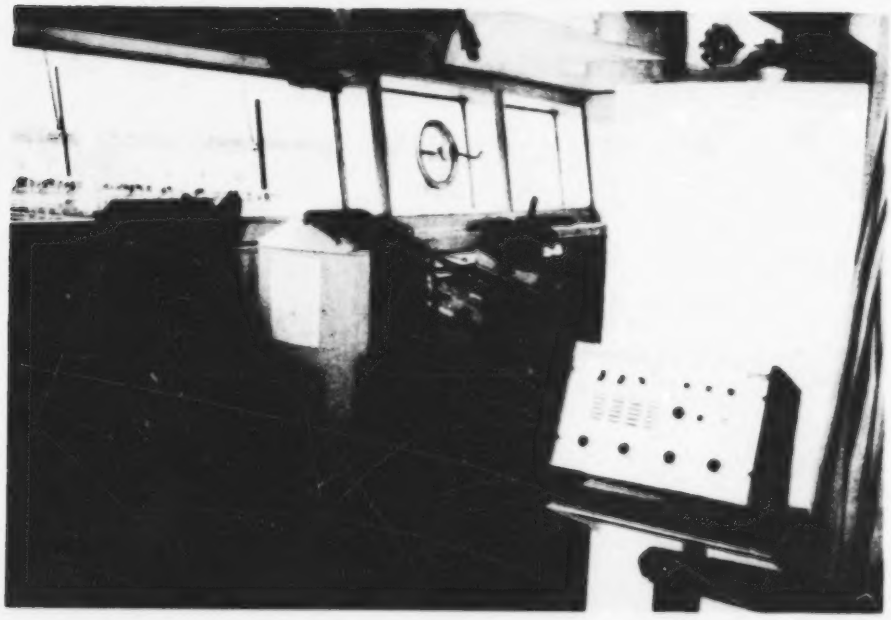
Other Findings

During conditions of restricted visibility, no fog signal was being sounded nor was a look-out posted.

The course-recorder fitted aboard the vessel was not in use, nor is there a mandatory requirement for such use.


MUNUSCONG LAKE
46°10'N
PROJECT DEPTH 28 FEET (see note B)
CANADA
UNITED STATES
LOWER COURSE B
MAGNETIC
VAR 0°30 W (1989)
1. THE INFORMATION ON THIS CHART HAS BEEN COMPILED BY THE MARINE CASUALTY INVESTIGATIONS BRANCH
2. ALL TRACKS AND POSITIONS ARE APPROXIMATE
1. LA DIRECTION DES ENQUÊTES SUR LES ACCIDENTS MARITIMES A COMPILÉ LES RENSEIGNEMENTS SUR CETTE CARTE
2. TOUS LES SILLAGES ET POSITIONS SONT APPROXIMATIVES
APPROXIMATE POSITION
POSITION APPROXIMATIVE
VESSEL NAVIRE
GROUNDED ÉCHOUÉ
Point aux Frenes
Hay Point
"BLACK BAY"
SECTION OF US NOAA CHART No. 14882
SECTION DE LA CARTE AMERICAINE NOAA No. 14882
DEPTHS IN FEET
PROFONDEURS EN PIEDS
Round Island
Bass Reef Island
ROUND ISLAND COURSE
PROJECT DEPTH 28 FEET (see note B)
L. Nipigon
FORT WILLIAM
KAPUSKASING
TIMMINS
Lake Superior
SAULT STE MARIE
SUDBURY
NORTH BAY
MONTREAL
OTTAWA
Lake Michigan
Lake Huron
TORONTO
L. Ontario
HAMILTON
WINDSOR
Lake Erie
84°05'W
84°00'W
46°05'N

The "GRENA" secured at the Rodney container terminal.
Le "GRENA" amarré au terminal à conteneurs Rodney.



The bridge of the "GRENA" from the port side.
To the left is the radar used by the pilot.

Le passerelle du "GRENA" vue de bâbord.
à gauche, le radar utilisé par le pilote.

"GRENA"

Grounding at Saint John, N.B., May 27, 1989

Summary

The "GRENA" is a Norwegian-registered, geared bulk carrier of 21,006 gross tons, built in Japan in 1974. Her navigating bridge, machinery space and accommodation are all located aft.

On the morning of May 27, 1989, the "GRENA" arrived at Saint John, N.B. to load a parcel of potassium. It was not yet daybreak and visibility was poor in rain and fog as the pilot boarded and she headed in towards the terminal in Courtenay Bay. Being partly loaded from the US East Coast the "GRENA" was drawing 7.0 m forward and 8.2 aft as she proceeded inwards to meet her two berthing tugs at buoy JC4. Despite a report from one of the tugs of poor visibility in the harbour, the decision had been made to continue to the berth to take advantage of the upcoming high tide. Berthing 'windows' are restricted at the terminal because of the strong ebb current and the limited depth in the channel.

The "GRENA" was proceeding at some 6 to 7 knots through the water in Courtenay Bay Channel and as she began to turn to starboard she appeared to swing too rapidly and port helm was ordered to check the swing. After the officer stationed forward for berthing reported that a green buoy was close ahead to starboard the main engine was put full astern but the "GRENA" continued out of the channel. The vessel came to a stop abreast of the buoy and then backed up and, at 0456, the impact of the stern striking the bottom was felt. The vessel had swung around to an approximate heading of 100°(T) and was aground between Round Reef and buoy JC9.

Soundings outside the vessel indicated that she was aground only aft and soundings inside the vessel showed no ingress of water. When ballast was pumped out to lighten the vessel, the precaution was taken of keeping some water for cooling the generators as the "GRENA" would be left spectacularly high and dry in front of the city at low water. The vessel was aground on sand which helped to limit any damage to minor dents and scratches. At 1615, with the assistance of 6 tugs, the "GRENA" was refloated at almost high tide after which she proceeded to a berth at the container terminal for hull inspection.

Findings

On the morning of May 27, 1989, the Norwegian bulk carrier "GRENA" ran aground outside of the channel leading into Courtenay Bay in the port of Saint John, New Brunswick following an error in navigation under conditions of reduced visibility.

It appears that the following factors contributed to the casualty:

- despite the darkness and poor visibility reported in the port, the vessel continued in toward Courtenay Bay;

- in the area of the Courtenay Bay breakwater, the set caused by the complex current resulting from the outflow of the Saint John River and the flood tide was incorrectly estimated;

- in this location the position of the vessel was misjudged and, at this inappropriate time, the speed of the main engine was reduced and the helm was put over to port;

- the vessel then continued outside the channel, leaving green buoy JC9 on the wrong side and the emergency stop which followed not only stopped the vessel but also caused her to go astern while turning in a circle.

- there was confusion regarding the presentation of the radar display, such that the person having the conduct of the vessel was disoriented after the emergency stop and measures were not taken to prevent the vessel from grounding stern first;

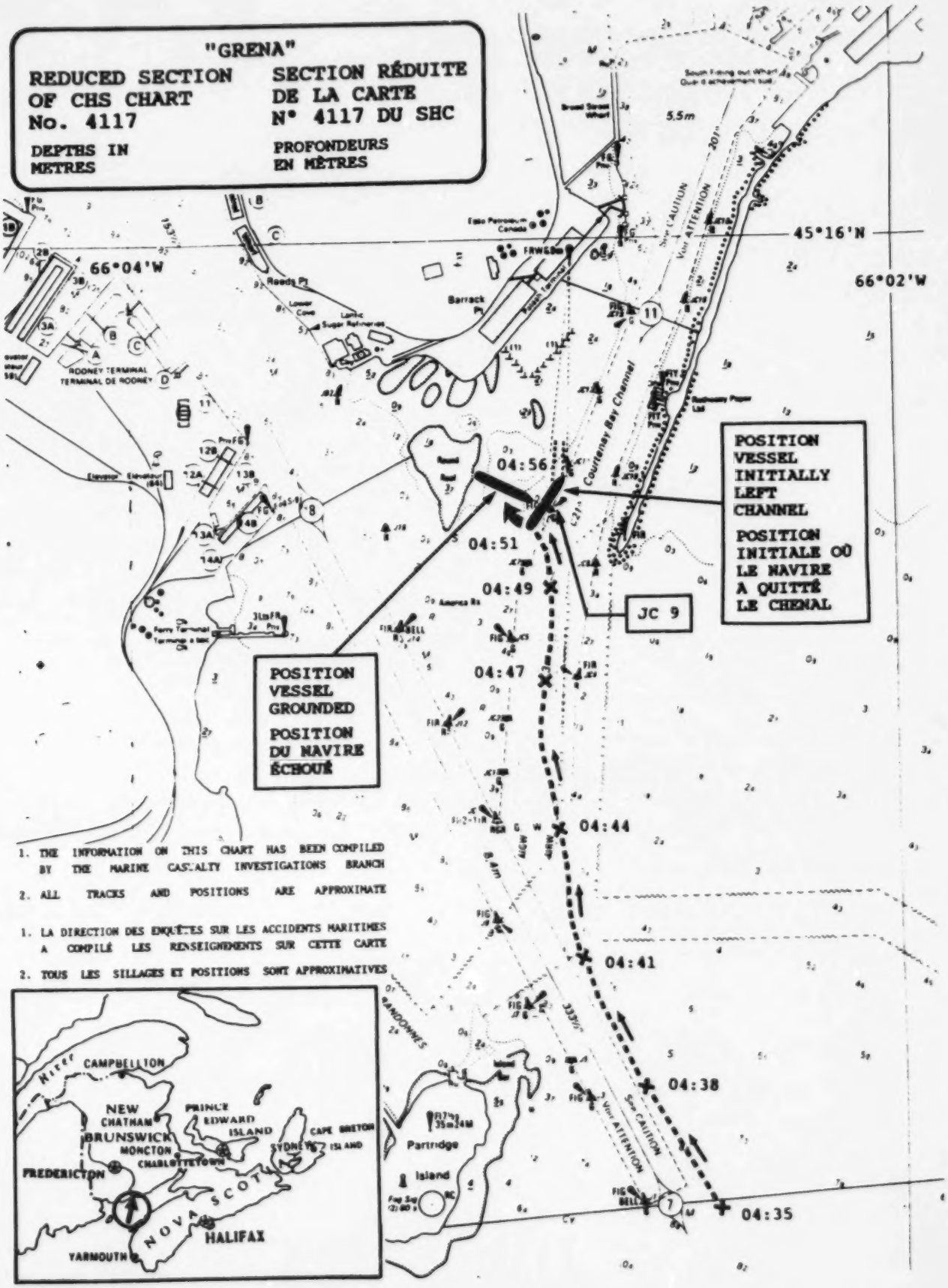
- no systematic method of instrument navigation was used.

Other Findings

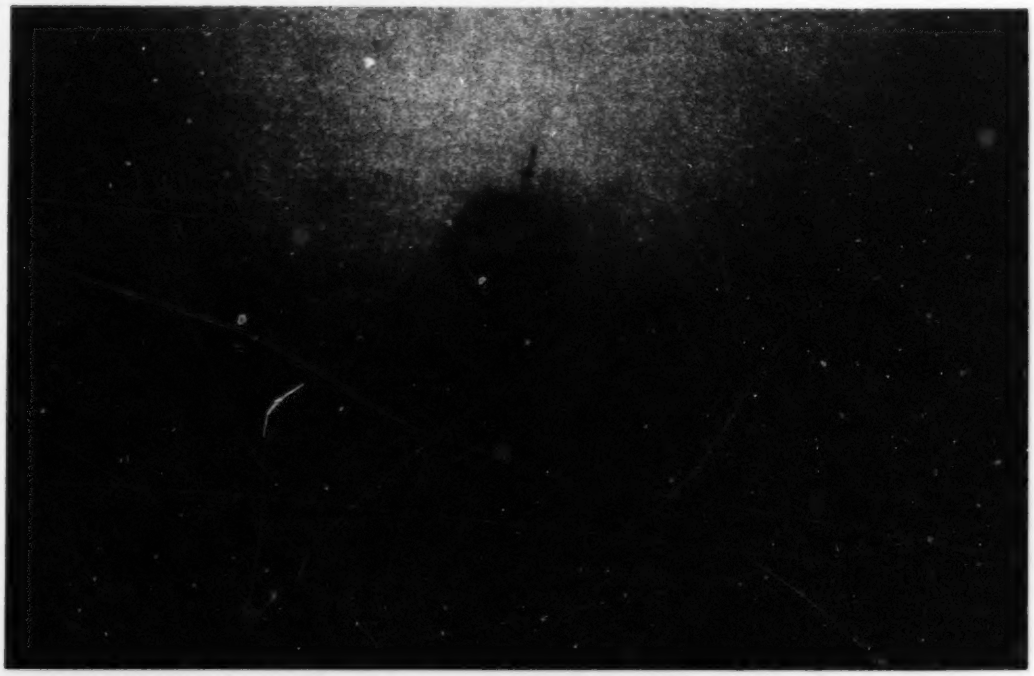
The VTS Centre is equipped with a radar surveillance installation, but it is not intended to be used to systematically plot the vessels' progress. Even if the progress of the "GRENA" had been systematically plotted, the sheer to port was so sudden that the regulator would probably not have had time to warn the vessel.

There was a shortage of personnel that morning at the VTS Centre for the Bay of Fundy. That shortage was not corrected, despite the conditions of reduced visibility which prevailed in the port.

The tugs "IRVING HEMLOCK" and "IRVING JUNIPER" which tried unsuccessfully to refloat the vessel were two of the least powerful tugs in the port of Saint John. No other tug could be dispatched rapidly to the scene of the casualty.


"GRENA"
REDUCED SECTION OF CHS CHART No. 4117
SECTION RÉDUITE DE LA CARTE N° 4117 DU SHC
DEPTHS IN METRES
PROFONDEURS EN MÈTRES
45°16'N
66°04'W
66°02'W
POSITION VESSEL INITIALLY LEFT CHANNEL
POSITION INITIALE OÙ LE NAVIRE A QUITTÉ LE CHENAL
POSITION VESSEL GROUNDED
POSITION DU NAVIRE ÉCHOUÉ
JC 9
04:56
04:51
04:49
04:47
04:44
04:41
04:38
04:35
Courtenay Bay Channel
Rooney Terminal
Terminal de Rooney
Reeds Pt
Barrack Pt
Lower Cove
Partridge Island
1. THE INFORMATION ON THIS CHART HAS BEEN COMPILED BY THE MARINE CASUALTY INVESTIGATIONS BRANCH
2. ALL TRACKS AND POSITIONS ARE APPROXIMATE
1. LA DIRECTION DES ENQUÊTES SUR LES ACCIDENTS MARITIMES A COMPILÉ LES RENSEIGNEMENTS SUR CETTE CARTE
2. TOUS LES SILLAGES ET POSITIONS SONT APPROXIMATIVES
CAMPBELLTON
NEW BRUNSWICK
CHATHAM
MONCTON
CHARLOTTETOWN
PRINCE EDWARD ISLAND
SYDNEY
CAPE BRETON ISLAND
FREDERICTON
NOVA SCOTIA
HALIFAX
YARMOUTH

"LA RELÈVE II"



Being refloated by the Canadian Park Service boat.
Le renflouage par le bateau du Service canadien des parcs.

Secured alongside at Havre-Saint-Pierre.
Amarré à Havre-Saint-Pierre.

"LA RELEVE II"

Grounding near Havre-Saint-Pierre
July 5, 1989

Summary

At about 1600, July 5, 1989, the "LA RELEVE II" a small cruise boat of 20 gross tons, sailed from the harbour of Havre-Saint-Pierre with 49 passengers aboard for a cruise in the Mingan Archipelago. The draught was approximately 1.3 m and the crew consisted of the master and mate, complemented by a nature guide in the employ of the Canadian Parks Service. The cruise took place in thick fog, visibility near zero and the master alone did the navigating while the mate and the nature guide occupied the passengers attention.

The vessel headed west, rounding the northwest tip of Ile du Havre, before steering southwest towards Fantôme Channel. Navigation was being carried out by radar, which was set on a range of half a mile for the turn into the Fantôme Channel. After the turn, the master steered west, but had trouble resetting the radar image on a range of one and a half miles. A few moments later, at approximately 1635, the vessel, travelling virtually at full speed, or approximately 8 knots, suddenly struck a reef and ran aground some three cables northeast of Ile à Firmin.

The tide was falling, and the stranded vessel was listing heavily to starboard, but no leak or apparent damage was observed. An unsuccessful attempt was made to refloat the vessel by having the passengers move from side to side on the vessel. The master then called his base for assistance and, about 15 to 20 minutes later, Canadian Parks Service vessels arrived on the scene. The passengers were taken aboard three of these boats while a fourth was used to free the stranded vessel.

At approximately 1730, the "LA RELEVE II" was back in Havre-Saint-Pierre, and a diver then inspected the hull and confirmed that the grounding had not caused any damage. The casualty did not cause any injuries or pollution.

Findings

On the afternoon of July 5, 1989 the cruise boat "LA RELEVE II" ran aground with 49 passengers aboard in the Fantôme Channel near Havre-Saint-Pierre, Quebec, as a result of an error in navigation in conditions of reduced visibility.

It would appear that the following factors contributed to this potentially tragic grounding:

- the cruise was undertaken when visibility was reduced to a few dozen metres by thick fog;

- although there was a safer alternative route, they opted to take the Fantôme Channel, which is a narrow passage between two islands unmarked by any navigational aid;

- despite the fact that there was a mate on board, the master was observing the radar, steering, navigating and keeping watch alone;

- no systematic method of instrument navigation was used;

- given the location and the poor visibility, the excessive speed of the vessel left the master little time to check the vessel's position and correct the course; and

- the cruise boat ran aground virtually at full speed on a charted reef.

Other Findings

The inspection certificate authorizes the cruise boat to operate in fair weather only. However, the interpretation of the expression "fair weather" is left to the master's discretion.

The master had used eyeglasses to pass the sight test required to obtain his certificate of competency. On the day of the casualty, however, counter to his usual habit, the master did not have his eyeglasses with him.

This was the crew's second day of cruising in fog, and the master was apparently experiencing fatigue. He probably suffered a lack of concentration in navigating the vessel.

After the grounding, no radio communication was made on VHF channel 16 (156.8 MHz), the international emergency and distress frequency.

There was poor VHF reception areas in the Mingan Archipelago where communications are difficult between vessels and the Sept-Iles Coast Guard radio station.

It was noted during the investigation that the cruise boat's magnetic compass showed excessive deviation on various headings.

The rescue of the passengers was effected quickly and efficiently by small vessels of the Canadian Parks Service.

The "LA RELEVE II" had previously run aground in similar conditions in June 1987 when under the conduct of the same crew.

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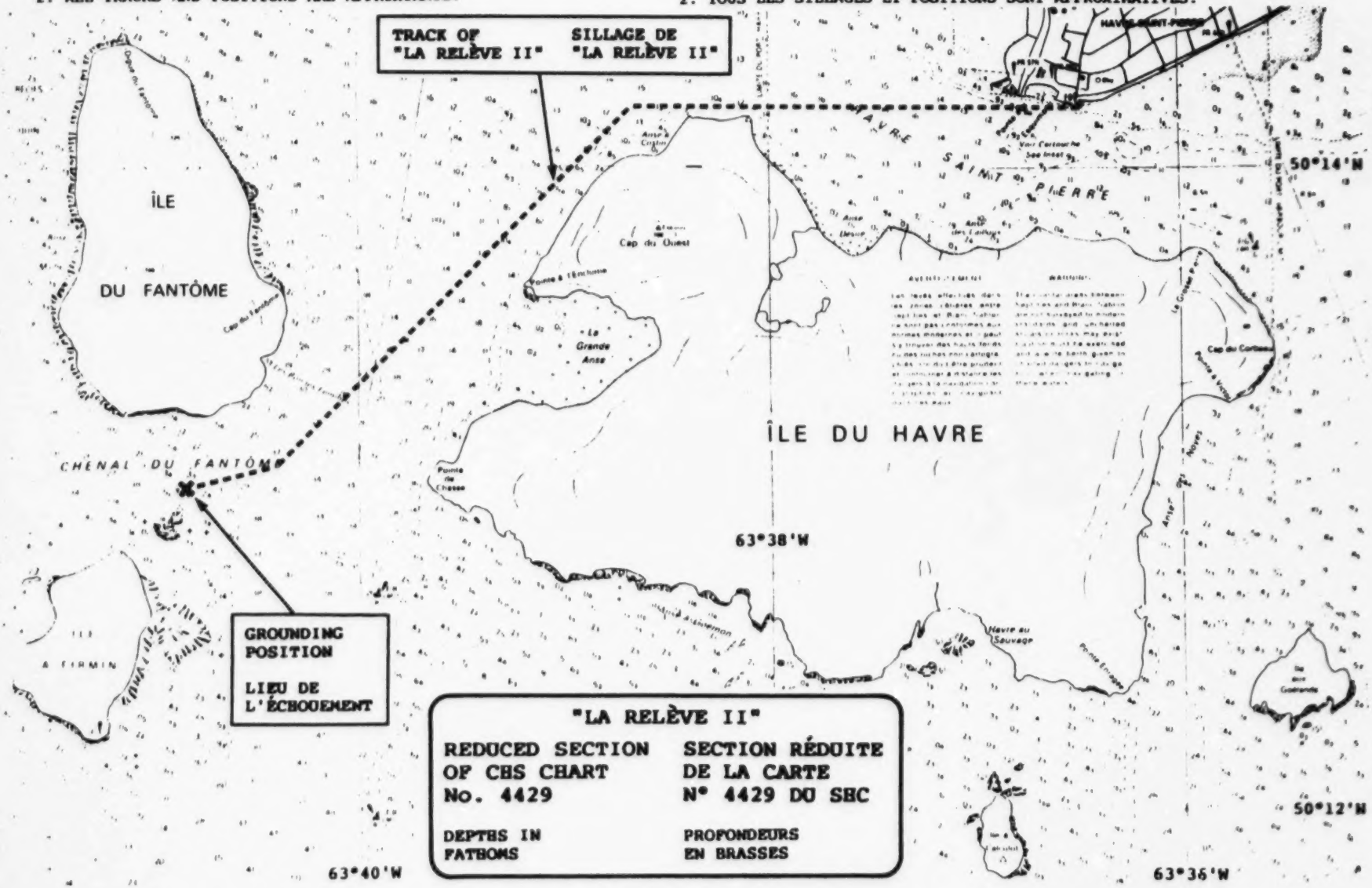

Glossary

Bight	Loop of rope
CPP	Controllable pitch propeller
CPR	Canadian Pacific Railway
Cable	One tenth of a nautical mile (185 m)
DB	Double bottom
DOT	Department of Transport
Dolphin	Mooring post or buffer at entrance to dock, usually composed of vertical, contiguous, piling
EPIRB	Emergency position-indicating radio beacon
to be 'Girded'	Condition of tug being dragged sideways by athwartship towline pull, can lead to capsizing, foundering
IFA	Industrial first aid
OOW	Officer of the watch
P/A	Public address
Pikepole	Long rod, fitted with hook, used in handling lines
QM	Quartermaster
RoRo	Roll on - Roll off
SAR IRB	Search and rescue inshore rescue boat
bank Suction	Effect felt by vessel navigating close to the side of a narrow channel
Yarding tug	Small tug used for marshalling barges etc. in a harbour